US EPA RECORDS CENTER REGION 5
1000497

Clean Harbors Services, Inc.
11800 S. Stony Island Ave.
Chicago, IL 60617

EPA ID No. ILD000608471

RCRA Part B License
Request for Permit
April 19, 2003

Volume 4
Appendices
Section A through D-9

APPENDIX B-1

LEGAL DESCRIPTION PREPARED BY
NATIONAL SURVEY SERVICES, INC.

CHICAGO REGIONAL PORT DISTRICT
LAKE CALUMET HARBOR

LEGAL DESCRIPTION
PARCEL 46 - 80

The part of the East 1/2 of Fractional Section 23 and of the West 1/2 of Section 24, all in Township 37 North, Range 14, East of the Third Principal Meridian, South of the Indian Boundary Line and that part of Lake Calumet in said Township and Range, described as follows:

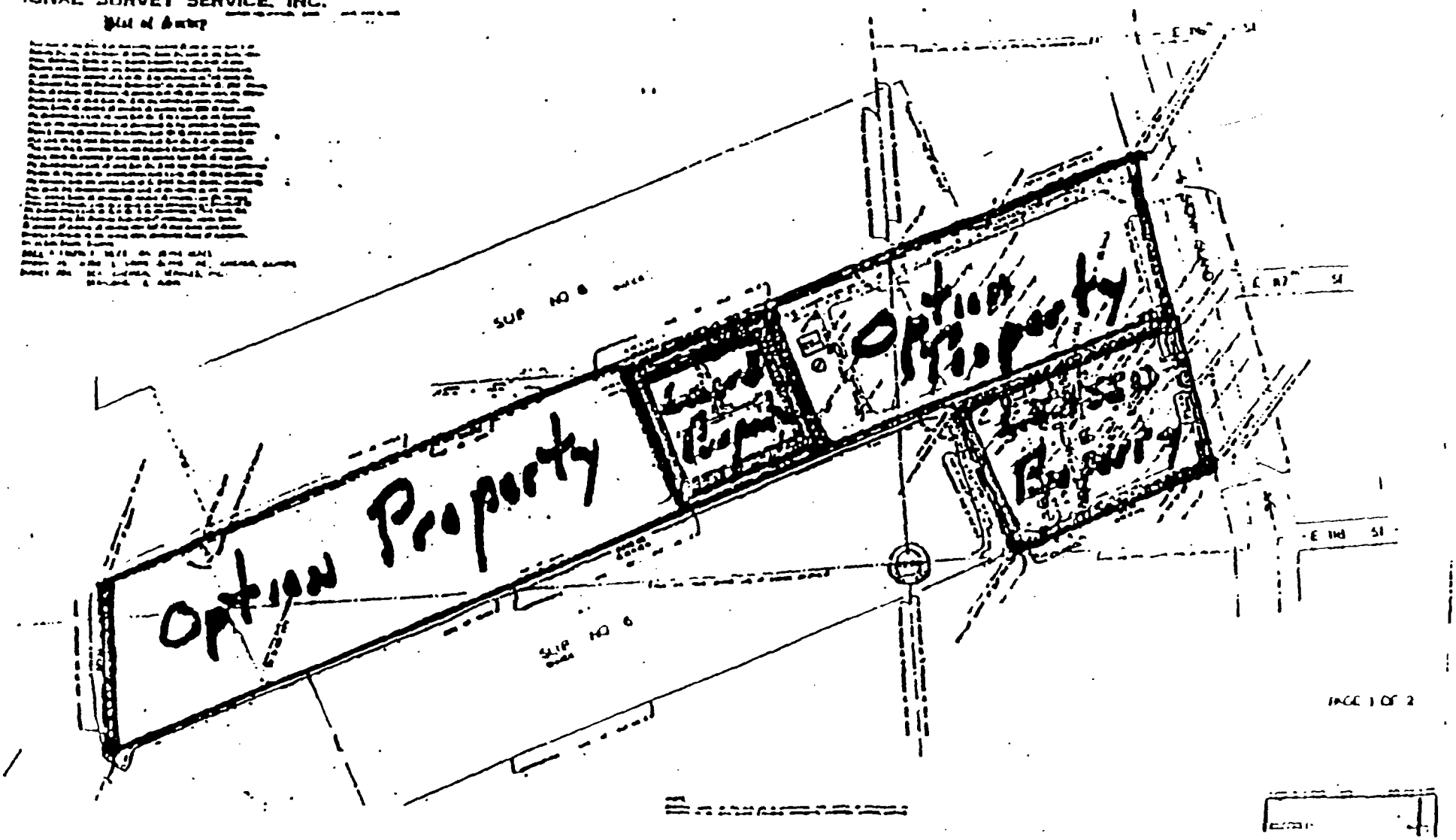
Beginning at the Southeast corner of Slip No. 6 as delineated in "The Arend Van Vlissingen Plan for Proposed Development: as amended May 12, 1967; thence North 70 degrees 17 minutes 19 seconds East 516.440 feet, along the Northeasterly extension of the Southeasterly line of said Slip No. 6 to the point of intersection with a line 100.0 feet Westerly of the parallel with the center line of South Stony Island Avenue, said center line being the Permanent Boundary Line as delineated on the aforesaid Plan; thence South 11 degrees 08 minutes 10 seconds East, 206.051 feet along said parallel line to an angle corner; thence South 0 degrees 21 minutes 48 seconds East, 208.012 feet along a line 100.00 feet Westerly of and parallel with said center line of South Stony Island Avenue to the point of intersection with the Northeasterly extension of the Northwesterly line of Slip No. 4 as delineated in the aforesaid Plan; thence South 70 degrees 17 minutes 19 seconds West, 2707.652 feet along said Northeasterly extension and along the Northwesterly line of said Slip No. 4 to an angle corner; thence North 88 degrees 54 minutes 55 seconds West 200.00 feet along the Southwesterly line of said Slip No. 4 to a point of the Easterly line of the Anchorage Basin as delineated on said plan; thence North 01 degree 05 minutes 05 seconds East 351.919 feet along said Easterly line to the Southwest corner of said Slip No. 6; thence North 70 degrees 17 minutes 19 seconds East, 2351.91 feet along the Southeasterly line of said Slip No. 6 to the herein designated place of beginning, in Cook County, Illinois.

Containing 26.5067 Acres.

EXHIBIT A

That part of the East 1/2 of Fractional Section 23 and of the West 1/2 of Section 24, all in Township 37 North, Range 14, East of the Third Principal Meridian, South of the Indian Boundary Line and that of Lake Calumet in said Township and Range, described as follows: Commencing at the Southeast corner of Slip No. 6 as delineated in "the Arend Van Vlissingen Plan for Proposed Development" as amended May 12, 1967; thence North 19 degrees 42 minutes 41 seconds West 400.00 feet along the Northeasterly line of said Slip No. 6 to the Northeast corner thereof; thence South 70 degrees 17 minutes 19 seconds West 2200.00 feet along the Northwesterly line of said Slip No. 6 to a point on the Easterly line of the Anchorage Basin as delineated on the aforesaid plan; thence North 1 degree 05 minutes 05 seconds East 427.88 feet along said Easterly line to the most Southerly corner of Slip No. 8 as delineated in "The Arend Van Vlissingen Plan for Proposed Development" aforesaid; thence North 70 degrees 17 minutes 19 seconds East 2686.12 feet along the Southeasterly line of said Slip No. 8 and the Northeasterly extension thereof to the point of intersection with a line 100.00 feet Westerly of and parallel with the center line of S. Stony Island Avenue, said center line being the permanent boundary line as delineated on the aforesaid Plan; thence South 11 degrees 08 minutes 10 seconds East 809.04 feet along said parallel line to a point on the Northeasterly Extension of the Southeasterly line of Slip No. 6 as delineated in "The Arend Van Vlissingen Plan for Proposed Development" aforesaid; thence South 70 degrees 17 minutes 19 seconds West 517.40 feet along said Northeasterly extension to the herein above designated place of beginning, all in Cook County, Illinois, ~~excluding therefrom~~ including that portion of the property indicated as the "Option Property" on the Plat of Survey attached hereto as Schedule 1 but including an easement for access across the Option Property between the two parcels indicated as "Leased Property" on said Plat of Survey.

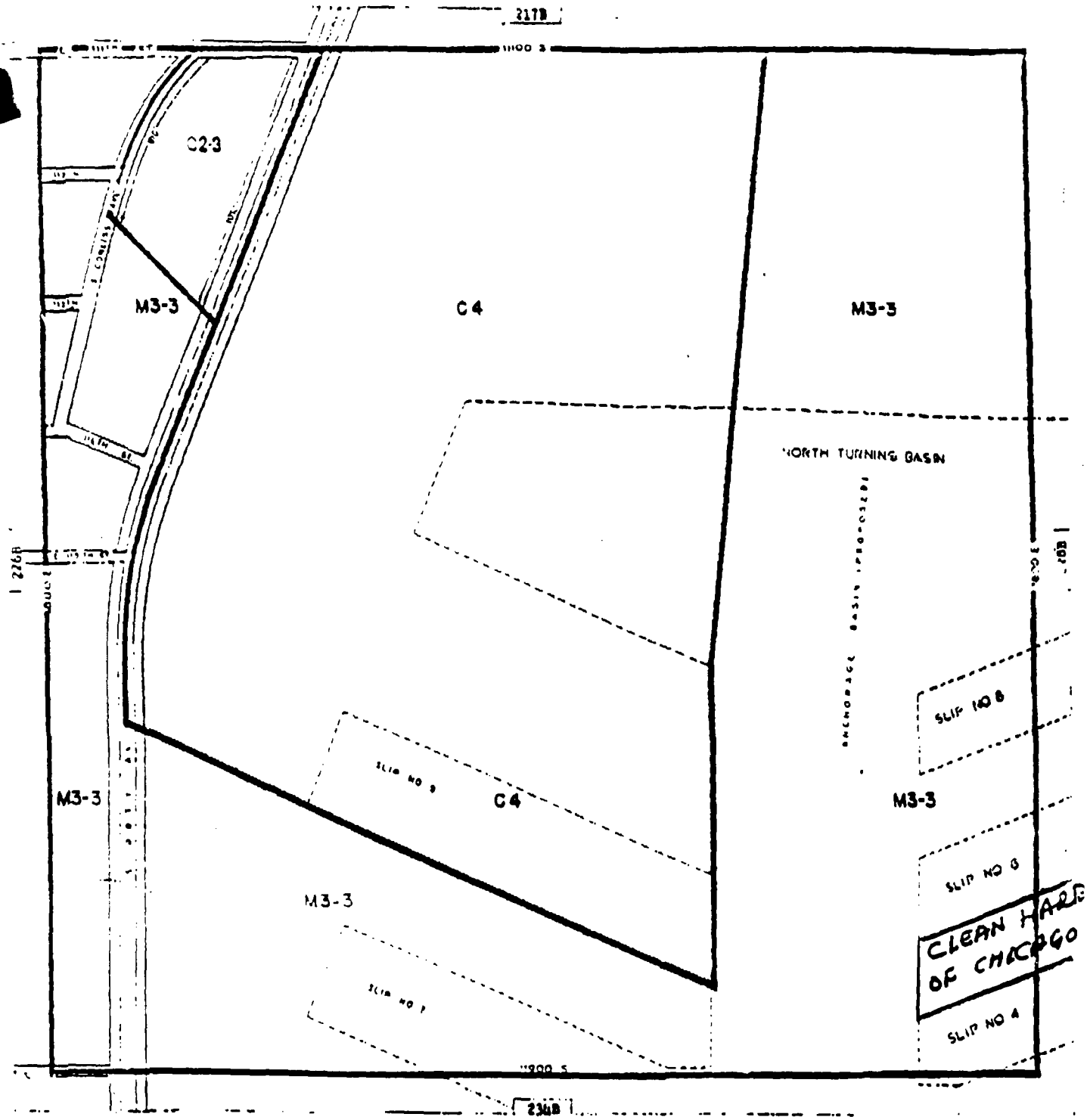
IONAL SURVEY SERVICE, INC.



PAGE 1 OF 2

APPENDIX B-2

CITY OF CHICAGO ZONING ORDINANCE
PAGE NOS. 227B, 228B, 234B, AND 235B
AMENDED JANUARY 1, 1971



CLEAN HARBOR OF CHICAGO

RESIDENCE DISTRICTS

R1 SINGLE-FAMILY RESIDENCE DISTRICT
R2 SINGLE-FAMILY RESIDENCE DISTRICT
R3 GENERAL RESIDENCE DISTRICT
R4 GENERAL RESIDENCE DISTRICT
R5 GENERAL RESIDENCE DISTRICT
R6 GENERAL RESIDENCE DISTRICT
R7 GENERAL RESIDENCE DISTRICT
R8 GENERAL RESIDENCE DISTRICT

BUSINESS DISTRICTS

B1-1 TO B1-5 LOCAL RETAIL DISTRICTS
B2-1 TO B2-5 RESTRICTED RETAIL DISTRICTS
B3-1 TO B3-5 GENERAL RETAIL DISTRICTS
B4-1 TO B4-5 RESTRICTED SERVICE DISTRICTS
B5-1 TO B5-5 GENERAL SERVICE DISTRICTS
B6-6 AND B6-7 RESTRICTED CENTRAL BUSINESS DISTRICTS
B7-5 TO B7-7 GENERAL CENTRAL BUSINESS DISTRICTS

COMMERCIAL DISTRICTS

C1-1 TO C1-5 RESTRICTED COMMERCIAL DISTRICTS
C2-1 TO C2-5 GENERAL COMMERCIAL DISTRICTS
C3-5 TO C3-7 COMMERCIAL-MANUFACTURING DISTRICTS
C4 MOTOR FREIGHT TERMINAL DISTRICT

MANUFACTURING DISTRICTS

M1-1 TO M1-5 RESTRICTED MANUFACTURING DISTRICTS
M2-1 TO M2-5 GENERAL MANUFACTURING DISTRICTS
M3-1 TO M3-5 HEAVY MANUFACTURING DISTRICT

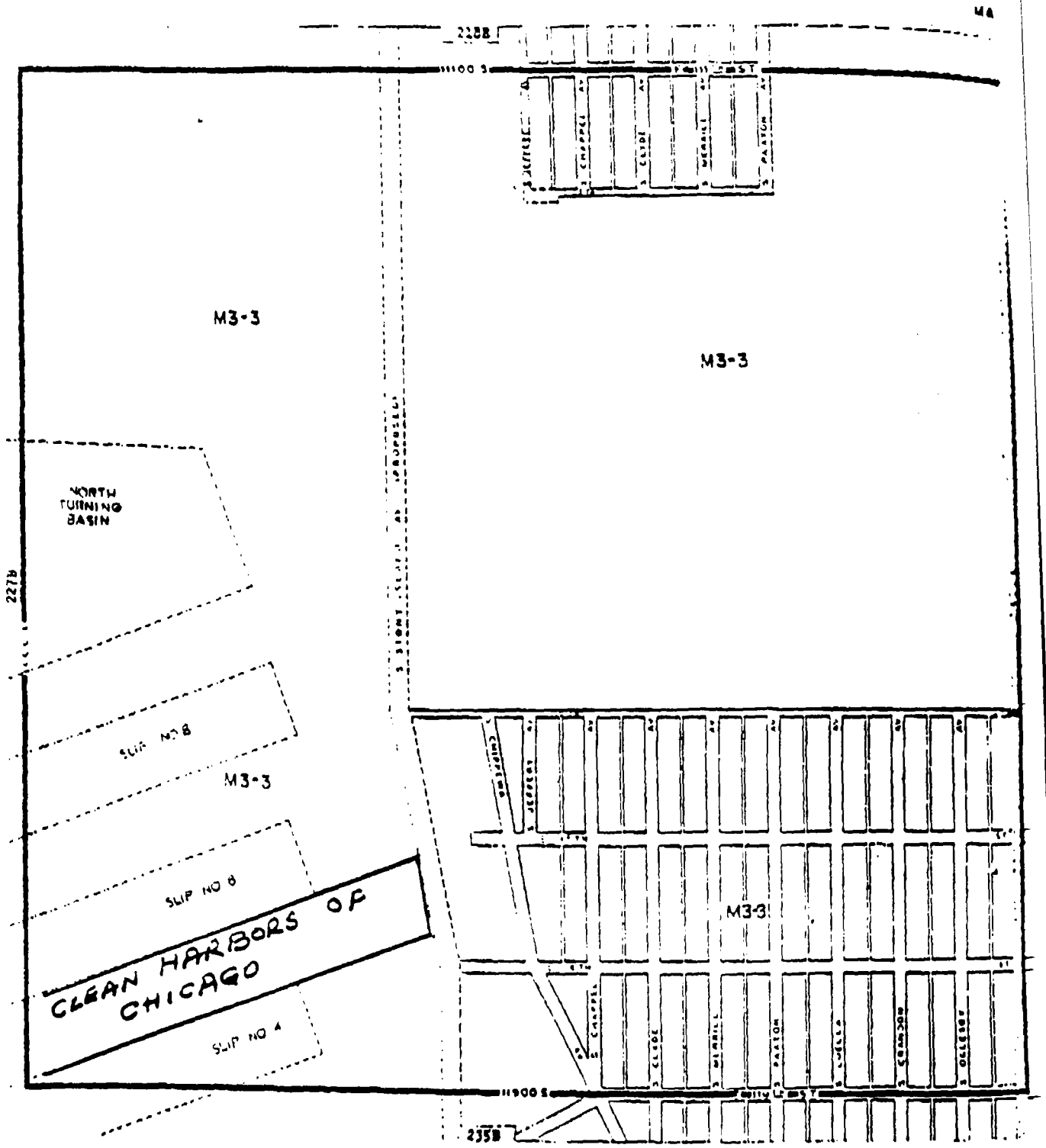
FOR USE AND BULK REGULATIONS, RESIDENCE DISTRICTS, SEE ARTICLE 7.
FOR USE AND BULK REGULATIONS, BUSINESS DISTRICTS, SEE ARTICLE 8.
FOR USE AND BULK REGULATIONS, COMMERCIAL DISTRICTS, SEE ARTICLE 9.
FOR USE AND BULK REGULATIONS, MANUFACTURING DISTRICTS, SEE ARTICLE 10

NORTH

SCALE IN FEET

PT'S OF SEC'S. 13, 14 & 23 T.37N. R.14E. S.I.B.L.
PT. OF SEC. 24 T.37N. R.14E.

M4



RESIDENCE DISTRICTS

R1 SINGLE-FAMILY RESIDENCE DISTRICT
R2 SINGLE-FAMILY RESIDENCE DISTRICT
R3 GENERAL RESIDENCE DISTRICT
R4 GENERAL RESIDENCE DISTRICT
R5 GENERAL RESIDENCE DISTRICT
R6 GENERAL RESIDENCE DISTRICT
R7 GENERAL RESIDENCE DISTRICT
R8 GENERAL RESIDENCE DISTRICT

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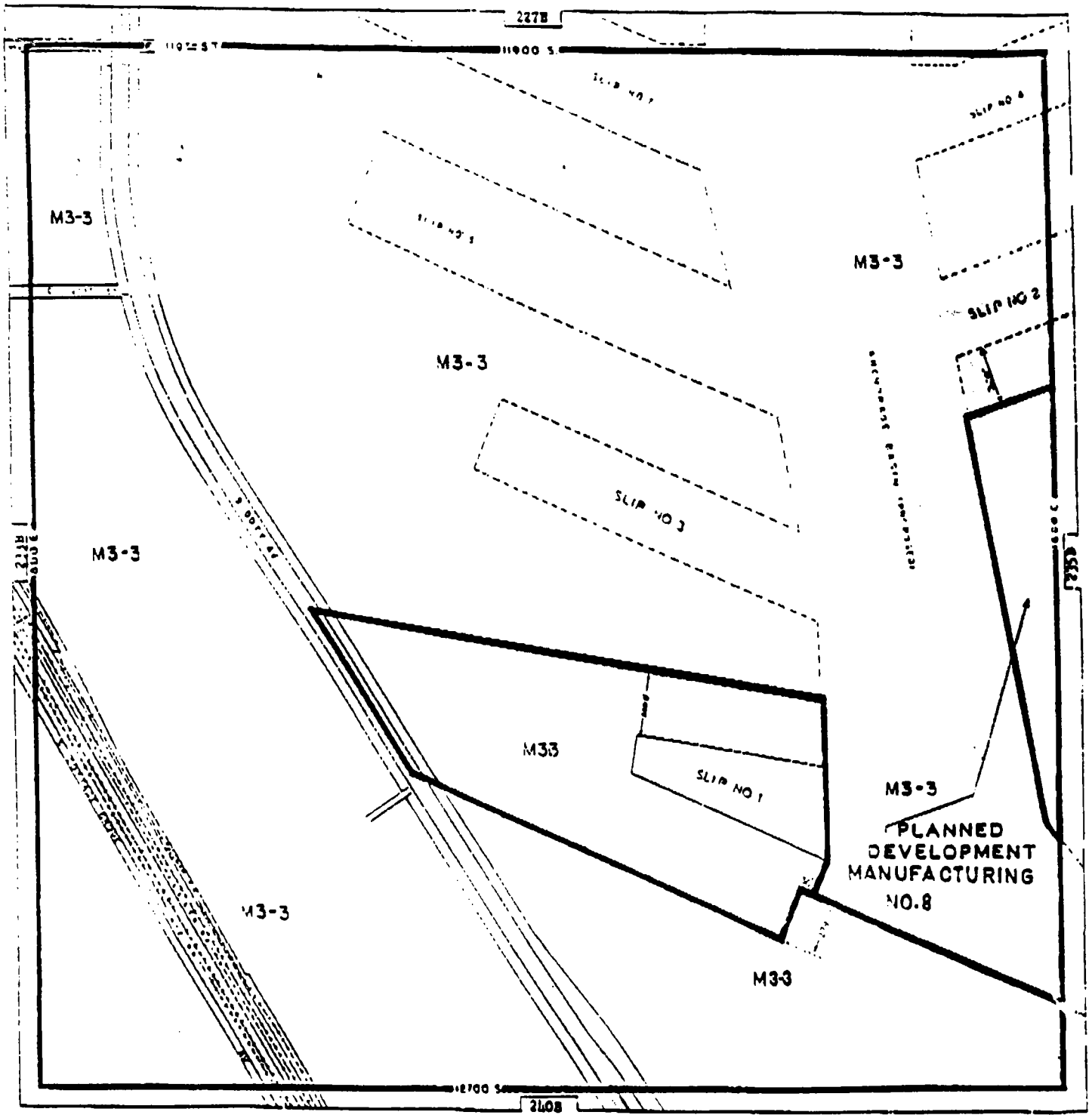
PT'S. OF SEC'S 22, 23 & 27 T.37N. R.14E. 3.1.B.L.
PT. OF SEC. 26 T.37N. R.14E.

MAP 30-O



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R5 GENERAL RESIDENCE DISTRICT
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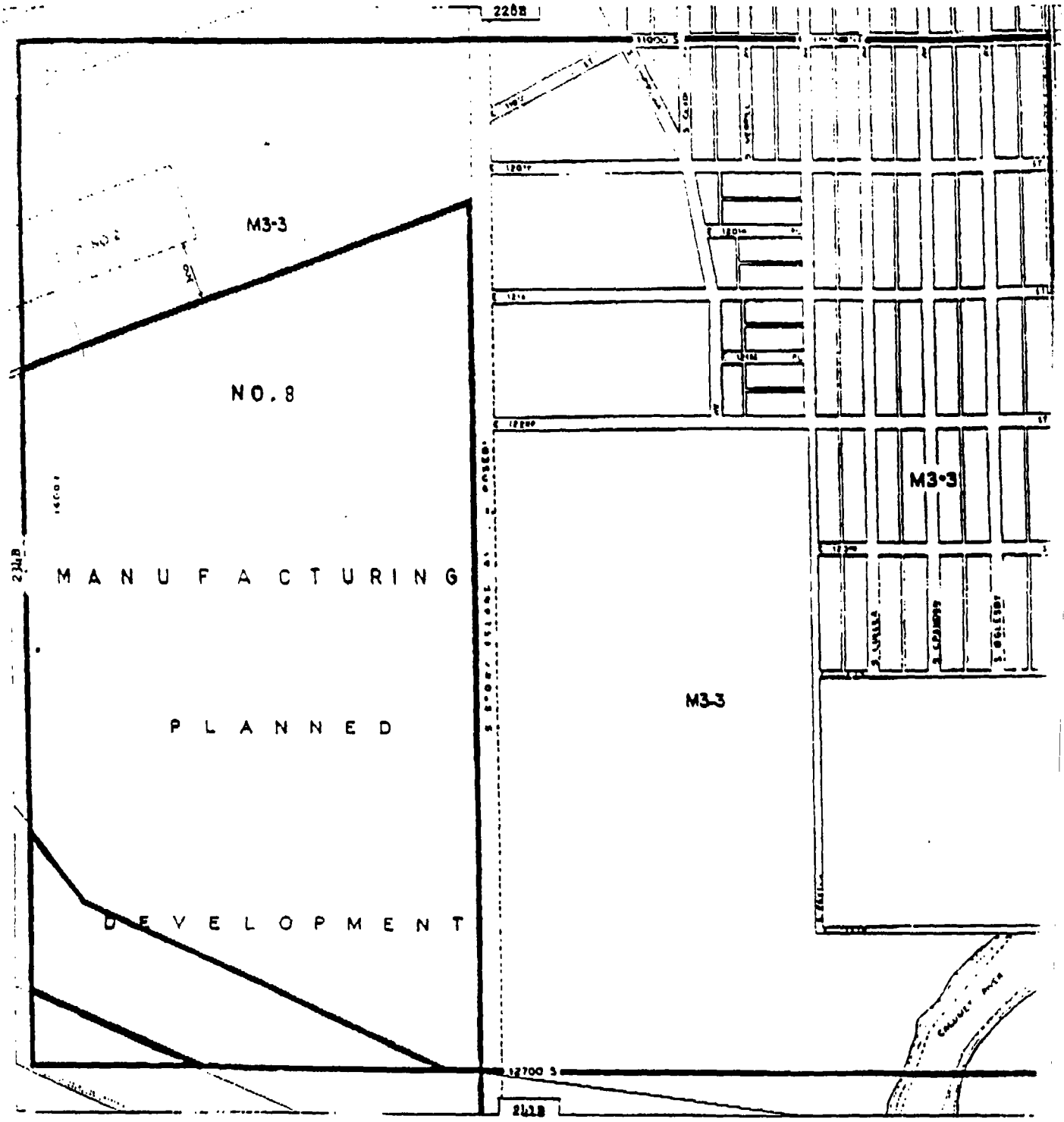
NORTH

SCALE IN FEET



RESIDENCE DISTRICTS

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FOR USE AND BULK REGULATIONS, COMMERCIAL DISTRICTS, SEE ARTICLE 9.
FOR USE AND BULK REGULATIONS, MANUFACTURING DISTRICTS, SEE ARTICLE 10

NORTH

SCALE IN FEET

AMENDED 1-1-72

HOYER-SCHLESINGER-TURNER inc
ENGINEERS & CONSTRUCTORS
100 west adams street chicago illinois 60603 telephone 263-0556 area code 312

January 24, 1991

Permit Section, RCRA Unit
Division of Land Pollution Control
Illinois Environmental Protection Agency
2200 Churchill Road
P.O. Box 19276
Springfield, Illinois 62794-9276

Re: Clean Harbors of Chicago, Inc.
11800 South Stony Island Avenue
Chicago, Illinois
Revised Part-B Permit Application

Dear Sir or Madam:

Please refer to: 0316000051--Cook County
Clean Harbors of Chicago
ILD000608471
RCRA Permit Log No. 16
RCRA Permit File

This response relates to Item B-3a on Page 1 of 14 "Seismic Standard". STS Consultants Ltd. were retained by the undersigned to investigate and report on faults within 200 feet of the Clean Harbors facility during the Holocene Epoc. Based upon the data presented, the STS conclusion and our review, we are of the opinion that there have been no indications of faults nor displacements within the Holocene time frame.

A copy of the STS report is attached as part of this response.

Respectfully submitted,

HOYER-SCHLESINGER-TURNER, INC.
Engineers - Constructors

Lee Schlesinger, P.E.
President
Licensed Professional Engineer
Illinois No. 18105
My License Expires on
November 30, 1992

LEE SCHLESINGER
18105
LICENSED PROFESSIONAL ENGINEER OF
ILLINOIS

LS/ar

December 18, 1990

Mr. Lee Schlesinger
Hoyer, Schlesinger, Turner, Inc.
300 W. Adams Street
Chicago, IL 60606

RE: Fault Zones Within the Area of the Clean Harbors Plant Project -- STS Project No. 26726

Dear Mr. Schlesinger:

We have completed our research into the presence of active fault zones within the area of the above referenced project. The Sandwich fault is the nearest fault zone to the subject site. It extends southeast from the vicinity of Oregon, Illinois, for a distance of about 80 miles into the southern portion of the Chicago area; southwest of Joliet (William and Templeton, 1951). The fault zone is thought to be related to a major disturbance at the end of the Paleozoic era (approximately 200 million years before present). A diagram indicating the location of the Sandwich fault is provided with this letter.

Based on our research, the Clean Harbors plant project site is not located within 200 feet of a fault zone which has been active during the Holocene Epoch, (approximately 10,000 years before present).

If you have any additional questions with regard to the information contained in this letter, please feel free to contact us.

Respectfully,

STS CONSULTANTS, LTD.

Jamie S. Matus
Geological Engineer

Robert G. Lukas, P.E.
Senior Principal Engineer

JSM/ngt/70.19

encl.

RECEIVED
DEC 1 8 1990
HOYER - SCHLESINGER - TURNER
HST # 1785

STS Consultants Ltd.
Consulting Engineers

111 Pfingsten Road
Northbrook, Illinois 60062
708.272.6520/Fax 708.498.2721

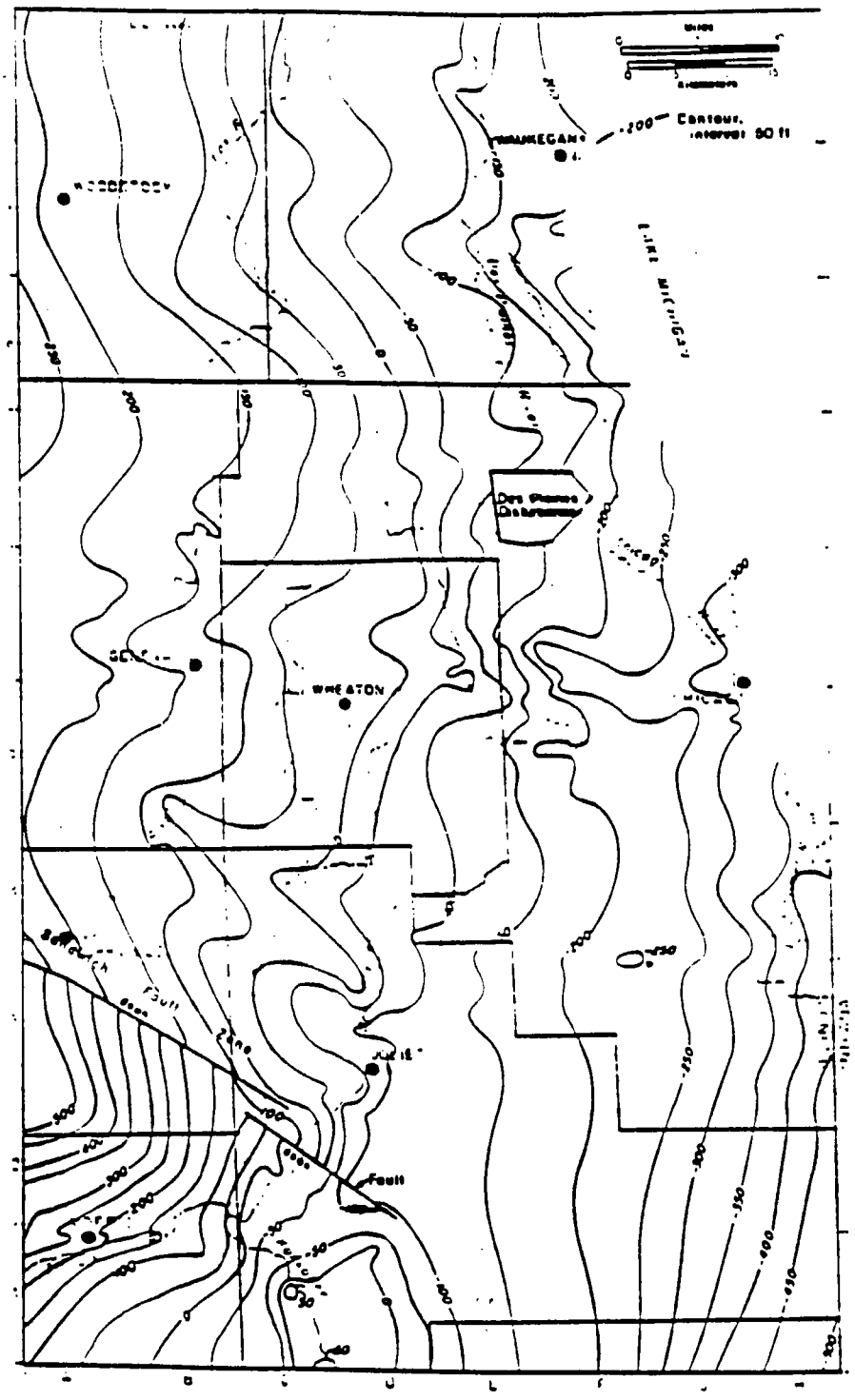


Fig. 12 - Geologic structure of the Chicago area. Contours on top of the Glenwood and St. Peter Sandstones (after Buschbach, 1964).

RECEIVED
HOYER - SCHLESINGER - TURNER
HST # 1785

HOYER-SCHLESINGER-TURNER inc.
ENGINEERS - CONSTRUCTORS
100 west adams street chicago illinois 60606 telephone 263-0556 area code 312

January 24, 1991

Permit Section, RCRA Unit
Division of Land Pollution Control
Illinois Environmental Protection Agency
2200 Churchill Road
P.O. Box 19276
Springfield, Illinois 62794-9276

Re: Clean Harbors of Chicago, Inc.
11800 South Stony Island Avenue
Chicago, Illinois
Revised Part-B Permit Application

Dear Sir or Madam:

Please refer to: 0316000051--Cook County
Clean Harbors of Chicago
ILD000608471
RCRA Permit Log No. 16
RCRA Permit File

This response relates to Item B-4 Traffic Information: 703.183 (j) on Page 1 of 14. To determine the adequacy of on-site roadways for over-the-road haulers the undersigned retained O'Brien & Associates to perform on-site investigations and report on same.

O'Brien & Associates on December 11, 1990 performed six test borings along the in-plant roadway system. The results indicated on overall coverage of 2'-0" of crushed stone (CA-6) compacted both during construction and over the years by traffic. Underlying the crushed stone is a hard clay fill with traces of stone. Both sampled materials are heavily compacted and stable.

The O'Brien organization states in their recommendations and we concur that the roadway system has sufficient thickness and degree of compaction for the safe support of highway truck traffic IDOT loading of 80,000 pounds total.

Access roads to the plant are all part of the City of Chicago roadway system.

A copy of the O'Brien & Associates report is attached as part of this response.

Respectfully submitted,

HOYER-SCHLESINGER-TURNER, INC.
Engineers - Constructors

Lee Schlesinger PE, SE
President
Licensed Professional Engineer
Illinois No. 18105
Licensed Structural Engineer
Illinois No. 2226
My licenses expire on
November 30, 1992

STATE OF ILLINOIS
LEE SCHLESINGER
2226
LICENSED
STRUCTURAL ENGINEER

LEE SCHLESINGER
18105
LICENSED
PROFESSIONAL
ENGINEER
OF
ILLINOIS

LS/ar
Encl.

RECEIVED
JAN
HOYER-SCHLESINGER-TURNER, INC.

SUBSURFACE INVESTIGATION
for the
Existing Roadway
Clean Harbors of Chicago
11800 South Stony Island Avenue
Chicago, Illinois

14 pages

O'BRIEN & ASSOCIATES, INC.
CONSULTING ENGINEERS
1235 E. DAVIS ST/ARLINGTON HTS, IL 60005
(708) 398-1441 • FAX (708) 398-2376

January 2, 1991

Hoyer Schlesinger Turner
300 West Adams Street
Chicago, IL 60606

Attention: Mr. Lee Schlesinger

Job No. 90521

Re: Subsurface investigation for the existing pavement, Clean Harbors of Chicago, 11800 South Stony Island Avenue, Chicago, Illinois

Dear Mr. Schlesinger:

Please find enclosed the results of the subsurface investigation for the existing pavement located at the above site.

This report has been based upon preliminary information regarding plans for the existing pavement and subsurface information obtained in six (6) borings.

If there are any questions with regard to the information submitted in this report, or if we can be of further assistance to you in any way, please do not hesitate to contact us.

Very truly yours,

O'BRIEN & ASSOCIATES, INC.

Vernon P. Brown

Vernon P. Brown
Engineering Geologist

Dixon O'Brien

Dixon O'Brien, P.E.
Vice President

VPB/DOB/jd

INTRODUCTION

We have completed the subsurface investigation for the existing pavement located at 11800 South Stony Island Avenue, Chicago, Illinois. The results of the six (6) soil borings performed at the site, along with a location diagram and general notes, are included with this report.

Boring locations were determined by field personnel without the aid of sophisticated surveying techniques and as such are considered to be approximate.

It is our understanding that the existing roadway is in relatively good condition and receives moderate to heavy truck traffic.

The purpose of this report is to describe the soil conditions encountered in the borings, to analyze and evaluate the data obtained, and to submit recommendations regarding the adequacy of the existing roadway.

SUBSURFACE INVESTIGATION PROCEDURES

The soil borings were performed on December 11, 1990 with a Mobile drilling rig and were advanced by means of continuous flight augers. Representative samples were obtained employing

split spoon sampling procedures in accordance with ASTM Specification D-1586. Samples obtained in the field were returned to our laboratory for further examination and testing.

Split spoon sampling involves driving a 2.0 inch outside diameter split-barrel sampler into the soil with a 140-pound weight falling freely through a distance of 30 inches. The number of blows required to advance the sampler the last 12 inches is termed the Standard Penetration Resistance (N) and is included on the boring logs. The N value is an indication of the relative density of the soil.

TESTING PROGRAM

The testing program consisted of performing water content tests on the granular and fill samples recovered. These tests were performed upon representative portions of the samples obtained in the field. The results of all testing performed, along with a classification of the material based upon a textural analysis, are indicated on the boring logs.

SOIL CONDITIONS

Specific soil conditions encountered in the borings are indicated on the soil boring logs. As indicated on the logs, a crushed limestone was encountered at the ground surface and extended to a depth of 2.0' to 2.5' below ground surface. The

crushed limestone appeared to be a gradation CA-6 material according to Illinois Department of Transportation Standard Specifications. Below the crushed limestone, a dark gray organic clay and stone fill was encountered and extended to the maximum depth of the borings, 4.0' below ground surface. This fill was relatively dense and had a high moisture content. The stratification lines shown on the boring logs represent the approximate boundary between soil types and the actual transition may be gradual.

WATER TABLE CONDITIONS

No water was encountered in the borings during the drilling operation. This information indicates that the phreatic surface is at or below a depth of 4.0' below the existing ground surface, the maximum depth of the borings. Fluctuations in the amount of water accumulated and in the hydrostatic water table can be anticipated, depending upon variations in precipitation and surface runoff.

ANALYSIS AND RECOMMENDATIONS

Based on the information obtained from the borings performed at the site and existing traffic conditions, the existing roadway has sufficient thickness for current traffic. The analysis of existing conditions was performed using Illinois Department of Transportation pavement design procedures.

The analysis and recommendations submitted in this report have been based upon available information. Because of the possibility of a variation in the soil conditions occurring between boring locations, it is recommended that we be allowed to review the information presented in this report should conditions significantly different than those described above be encountered.

This report has been based upon our understanding of the scope of the work of the project. Any changes in the design or location should be brought to our attention so that we might determine if these changes affect our recommendations.

GENERAL NOTES

CLASSIFICATION

Chicago Building Code Textural Soil Classifications and Unified Soil Classifications are used.

GENERAL

Trace	: 1% to 10%
Trace to some	: 10% to 20%
Some	: 20% to 35%
And	: 35% to 50%

Cohesionless Soils

Loose	: 0 to 9 blows	or
Medium Dense	: 10 to 29"	equivalent
Dense	: 30 to 59"	
Very Dense	: over 60"	

Cohesive Soils

If clay content is sufficient so that clay dominates soil properties, then clay becomes the principal noun with other major soil constituent as modifier: i.e., silty clay. Other minor soil constituents may be added according to classification breakdown for cohesionless soils: i.e., silty clay, trace to some sand, trace gravel.

Soft	: 0.00 - 0.59 tons/ft.^{2}
Stiff	: 0.60 - 0.99 tons/ft.^{2}
Tough	: 1.00 - 1.99 tons/ft.^{2}
Very tough	: 2.00 - 3.99 tons/ft.^{2}
Hard	: over 4.00 tons/ft.^{2}

DRILLING AND SAMPLING SYMBOLS

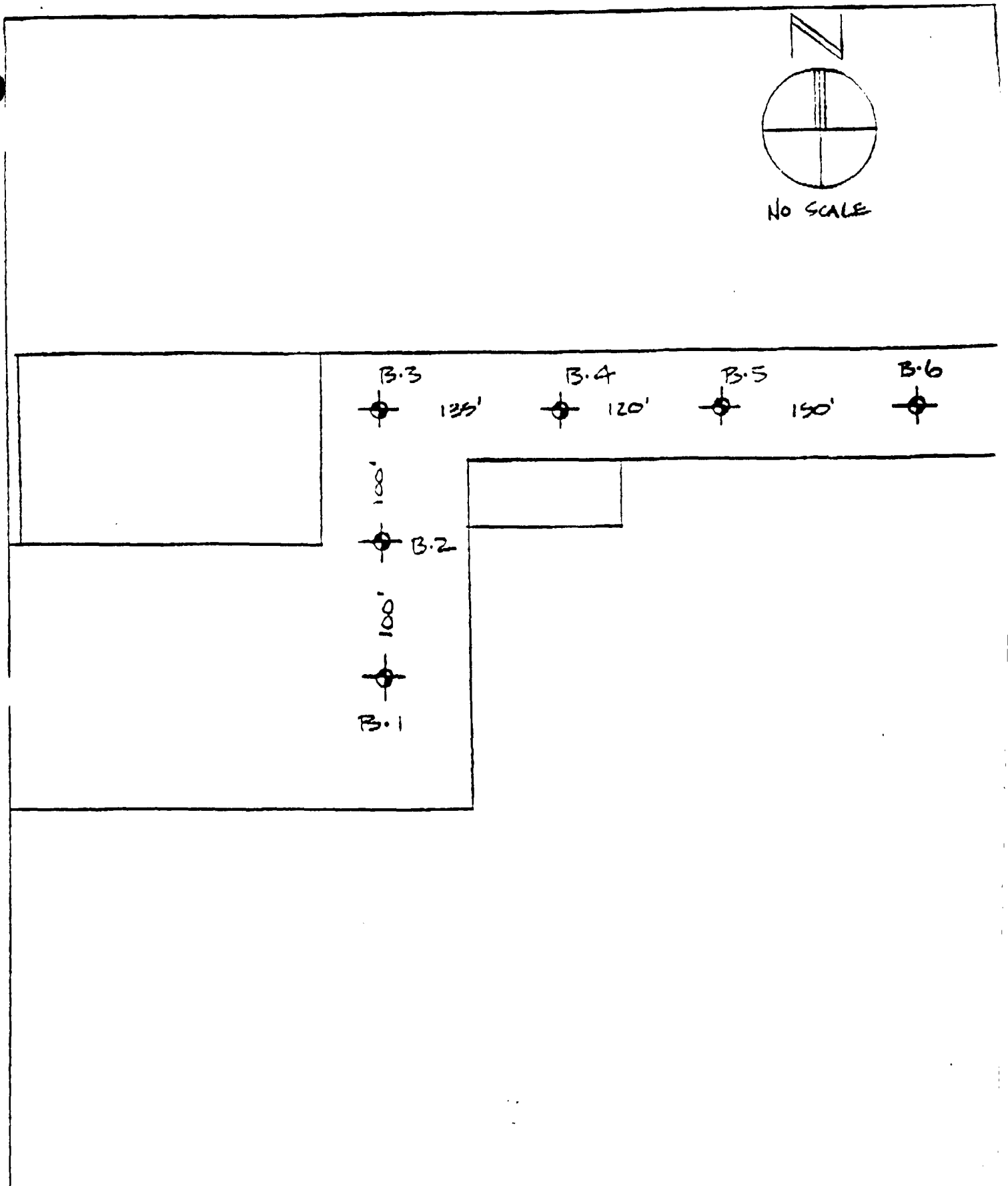
SS: Split spoon 1-3/8" I.D., 2" O.D.
ST: Shelby tube 2: o.d., except where
AS: Auger Sample
DB: Diamond Bit - NX: BX: AX
CB: Carboloy Bit - NX: BX: AX
OS: Osterberg Sampler
HS: Housel Sampler
WS: Wash Sample
FT: Fish Tail
RB: Rock Bit
WO: Wash Out

Standard "N" Penetration: Blows per foot of a 140 lb. hammer falling 30" on a 2" O.D. Split Spoon

WATER LEVEL MEASUREMENT SYMBOLS

WL : Water
WCI: Wet Cave In
DCI: Dry Cave In
WS : While sampling
WD: While Drilling
BCR: Before Casing Removal
ACR: After Casing Removal
AB: After Boring

Water levels indicated on the boring logs are the levels measu in the boring at the times indicated. In pervious soils, t indicated elevations are considered reliable ground water leve In impervious soils, the accurate determination of ground wa elevations is not possible in even several days observation, additional evidence on ground water elevations must be sought.



SOIL BORING LOCATION DIAGRAM	O'BRIEN & ASSOCIATES, INC.	DRAWN BY	JD
Existing Roadway Clean Harbors of Chicago 11800 South Stony Island Avenue Chicago, Illinois	CONSULTING ENGINEERS P.O. BOX 1231 ARLINGTON HEIGHTS, ILLINOIS (708) 398-1441	APPROVED BY	[illegible]
		DATE	1-3-91
		JOB NO.	90521

LOG OF BORING NO. B-1

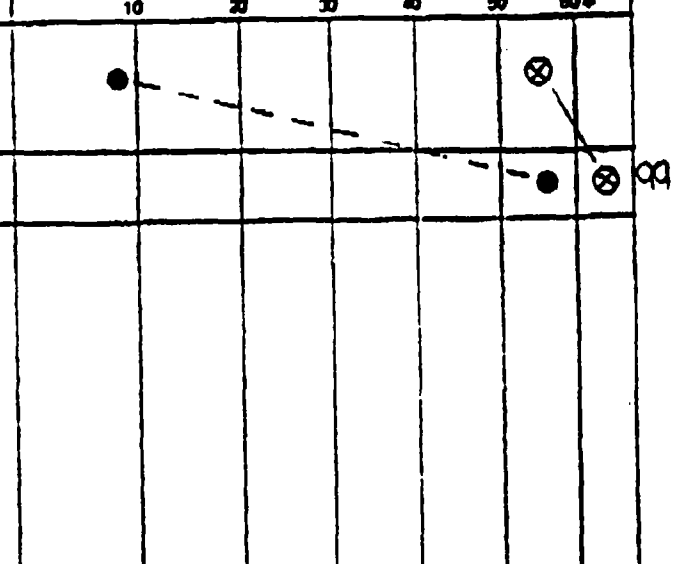
CLIENT: Hoyer Schlessinger Turner Inc.	ARCHITECT-ENGINEER:
LOCATION: th & Stony Island, Chicago, Illinois	PROJECT DESCRIPTION: Clean Harbors of Chicago

DEPTH BELOW GROUND SURFACE	SAMPLE NO.	TYPE SAMPLE	SAMPLE DISTANCE	SAMPLE RECOVERY	DESCRIPTION OF MATERIAL / GROUND SURFACE ELEVATION	UNIT DRY WT. LBS./FT.³
2.0	1	ss			Crushed Limestone	
4.0	2	ss			Dark gray organic clay and stone-hard-fill	
					End of Boring	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² ○

CALIBRATED PENETROMETER TONS/FT.² ○ 1 2 3 4 5 6+

WATER ● CONTENT % STANDARD "N" PENETRATION (BLOWS/FT.) ⊗ 10 20 30 40 50 60+



WATER LEVEL OBSERVATIONS	
W.L.	Dry
W.L.	

O'BRIEN & ASSOCIATES, INC.
Consulting Engineers
ARLINGTON HEIGHTS, ILLINOIS
(708) 398-1441

BORING STARTED	Dec. 11, 1990		
BORING COMPLETED	Dec. 11, 1990		
RIG	47	FOREMAN	TW
DRAWN	JD	APPROVED	DOB
JOB #	90521	SHEET	1 of 1

LOG OF BORING NO. B-2

CLIENT	ARCHITECT-ENGINEER
Hoyer Schlessinger Turner Inc.	
LOCATION	**PROJECT DESCRIPTION**
th & Stony Island, Chicago, Illinois	Clean Harbors of Chicago

DEPTH BELOW GROUND SURFACE	SAMPLE NO.	TYPE SAMPLE	SAMPLE DISTANCE	SAMPLE RECOVERY	DESCRIPTION OF MATERIAL / GROUND SURFACE ELEVATION	UNIT DRY WT. LBS./FT.³	UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² / CALIBRATED PENETROMETER TONS/FT.² / WATER CONTENT % / STANDARD "N" PENETRATION (BLOWS/FT.)	
2.0	1	ss			Crushed Limestone			15
4.0	2	ss			Gray organic clay and stone-hard-fill			15
					End of Boring			

WATER LEVEL OBSERVATIONS	
W.L.	Dry
W.L.	

O'BRIEN & ASSOCIATES, INC.
Consulting Engineers
ARLINGTON HEIGHTS, ILLINOIS
(708) 398-1441

BORING STARTED	Dec. 11, 1990		
BORING COMPLETED	Dec. 11, 1990		
RIG	47	FOREMAN	TW
DRAWN	JD	APPROVED	DOB
JOB #	90521	SHEET	1 of 1

LOG OF BORING NO. B-3

CLIENT	ARCHITECT-ENGINEER
Hoyer Schlessinger Turner Inc.	
LOCATION	**PROJECT DESCRIPTION**
118th & Stony Island, Chicago, Illinois	Clean Harbors of Chicago

DEPTH BELOW GROUND SURFACE	SAMPLE NO.	TYPE SAMPLE	SAMPLE DISTANCE	SAMPLE RECOVERY	DESCRIPTION OF MATERIAL / GROUND SURFACE ELEVATION	UNIT DRY WT. LBS./FT.³	UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² / CALIBRATED PENETROMETER TONS/FT.² (1, 2, 3, 4, 5, 6+) / WATER CONTENT % / STANDARD "N" PENETRATION (BLOWS/FT.) (10, 20, 30, 40, 50, 60+)
2.0	1	SS			Crushed Limestone		
4.0	2	SS			Gray organic clay and stone-hard-fill		
					End of Boring		

WATER LEVEL OBSERVATIONS	
W.L.	Dry
W.L.	

O'BRIEN & ASSOCIATES, INC.
Consulting Engineers
ARLINGTON HEIGHTS, ILLINOIS
(708) 398-1441

BORING STARTED	Dec. 11, 1990		
BORING COMPLETED	Dec. 11, 1990		
RIG	47	FOREMAN	TW
DRAWN	JD	APPROVED	DOB
JOB #	90521	SHEET	1 of 1

LOG OF BORING NO. B-4

CLIENT: Hoyer Schlessinger Turner Inc.

ARCHITECT-ENGINEER:

LOCATION: 98th & Stony Island, Chicago, Illinois

PROJECT DESCRIPTION: Clean Harbors of Chicago

DEPTH BELOW GROUND SURFACE	SAMPLE NO.	TYPE SAMPLE	SAMPLE DISTANCE	SAMPLE RECOVERY	DESCRIPTION OF MATERIAL / GROUND SURFACE ELEVATION	UNIT DRY WT. LBS./FT.³	UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² / CALIBRATED PENETROMETER TONS/FT.² (1, 2, 3, 4, 5, 6+) / WATER CONTENT % / STANDARD "N" PENETRATION (BLOWS/FT.) (10, 20, 30, 40, 50, 60+)	
2.0	1	SS			Crushed Limestone			73
4.0	2	SS			Gray organic clay, stone and slag-hard-fill			135
					End of Boring			

WATER LEVEL OBSERVATIONS

W.L. Dry

W.L.

O'BRIEN & ASSOCIATES, INC.
Consulting Engineers
ARLINGTON HEIGHTS, ILLINOIS
(708) 398-1441

BORING STARTED	Dec. 11, 1990		
BORING COMPLETED	Dec. 11, 1990		
RIG	47	FOREMAN	TW
DRAWN	JD	APPROVED	DOB
JOB #	90521	SHEET	1 of 1

LOG OF BORING NO. [illegible]

CLIENT
Hoyer Schlessinger Turner Inc.

ARCHITECT-ENGINEER

LOCATION
[illegible]th & Stony Island, Chicago, Illinois

PROJECT DESCRIPTION
Clean Harbors of Chicago

DEPTH BELOW GROUND SURFACE	SAMPLE NO.	TYPE SAMPLE	SAMPLE DISTANCE	SAMPLE RECOVERY	DESCRIPTION OF MATERIAL / GROUND SURFACE ELEVATION	UNIT DRY WT. LBS./FT.³	UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² / CALIBRATED PENETROMETER TONS/FT.² (1, 2, 3, 4, 5, 6+)	WATER CONTENT % / STANDARD "N" PENETRATION (BLOWS/FT.) (10, 20, 30, 40, 50, 60+)
2.0	1	SS			Crushed Limestone			
4.0	2	SS			Gray organic clay and stone-hard-fill			140
					End of Boring			

WATER LEVEL OBSERVATIONS

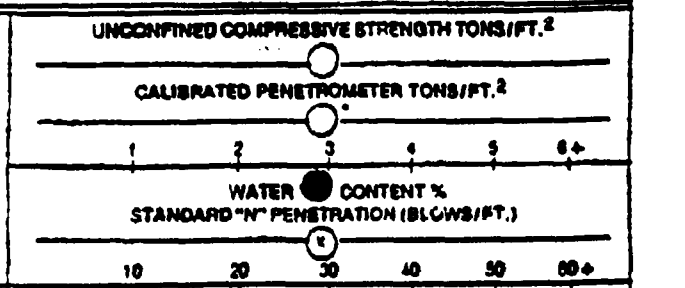
W.L.	Dry
W.L.	

O'BRIEN & ASSOCIATES, INC.
Consulting Engineers
ARLINGTON HEIGHTS, ILLINOIS
(708) 398-1441

BORING STARTED	Dec. 11, 1990		
BORING COMPLETED	Dec. 11, 1990		
RIG	47	FOREMAN	TW
DRAWN	JD	APPROVED	DOB
JOB #	90521	SHEET	1 of 1

CLIENT	ARCHITECT-ENGINEER
Hoyer Schlessinger Turner Inc.	
LOCATION	**PROJECT DESCRIPTION**
8th & Stony Island, Chicago, Illinois	Clean Harbors of Chicago

DEPTH BELOW GROUND SURFACE	SAMPLE NO.	TYPE SAMPLE	SAMPLE DISTANCE	SAMPLE RECOVERY	DESCRIPTION OF MATERIAL / GROUND SURFACE ELEVATION	UNIT DRY WT. LBS./FT.³
2.0	1	ss			Crushed Limestone	
4.0	2	ss			Gray organic clay and stone-hard-fill (odor noted)	
					End of Boring	



WATER LEVEL OBSERVATIONS	
W.L.	Dry
W.L.	

O'BRIEN & ASSOCIATES, INC.
Consulting Engineers
ARLINGTON HEIGHTS, ILLINOIS
(708) 398-1441

BORING STARTED	Dec. 11, 1990		
BORING COMPLETED	Dec. 11, 1990		
RIG	47	FOREMAN	TW
DRAWN	JD	APPROVED	DOB
JOB #	90521	SHEET	1 of 1

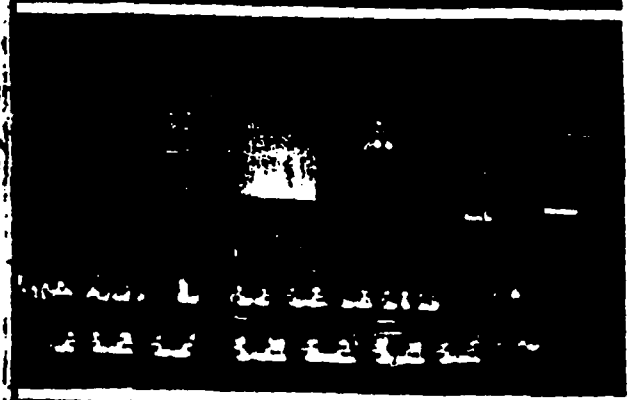
TOTAL P.17

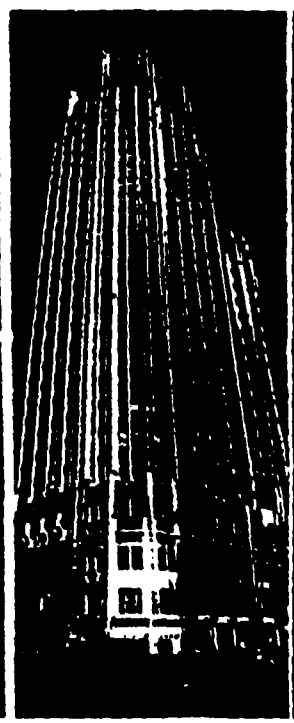
Chicago Tribune

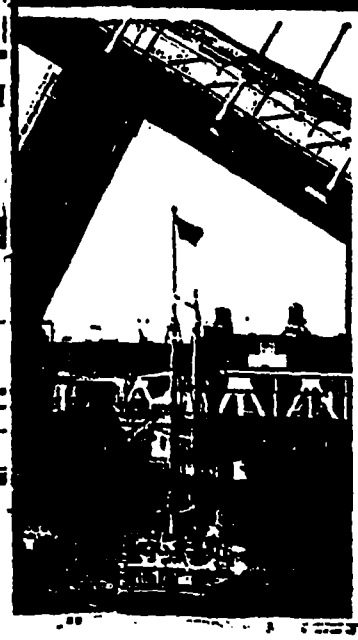
RAND McNALLY

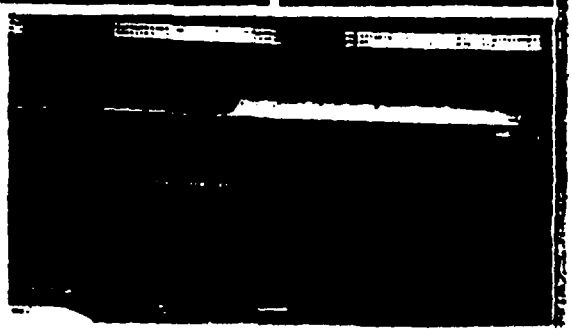
Chicagoland MAP

- Expanded metropolitan map, detailed Chicago streets
- Detailed downtown inset map
- Indexed points of interest

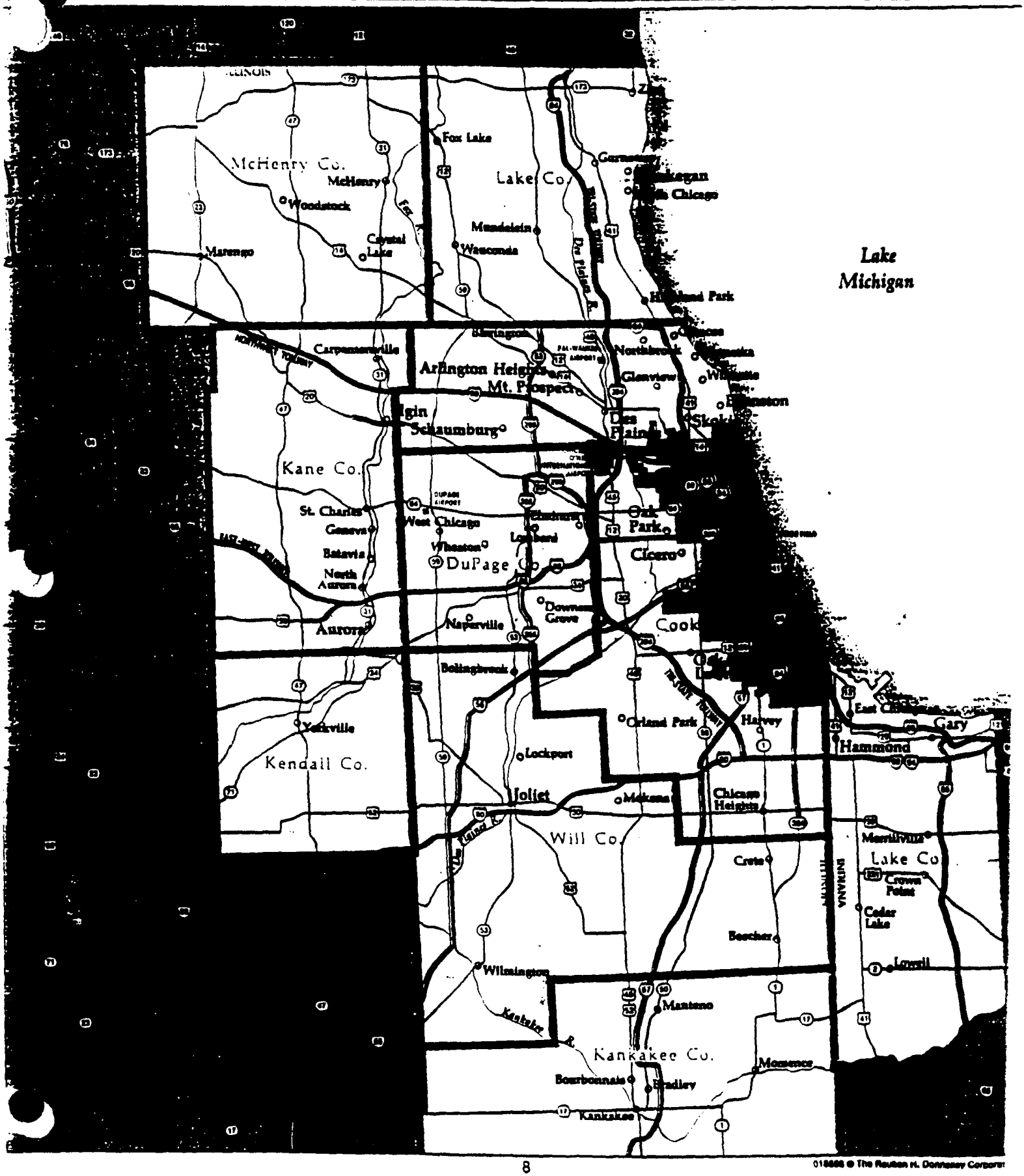




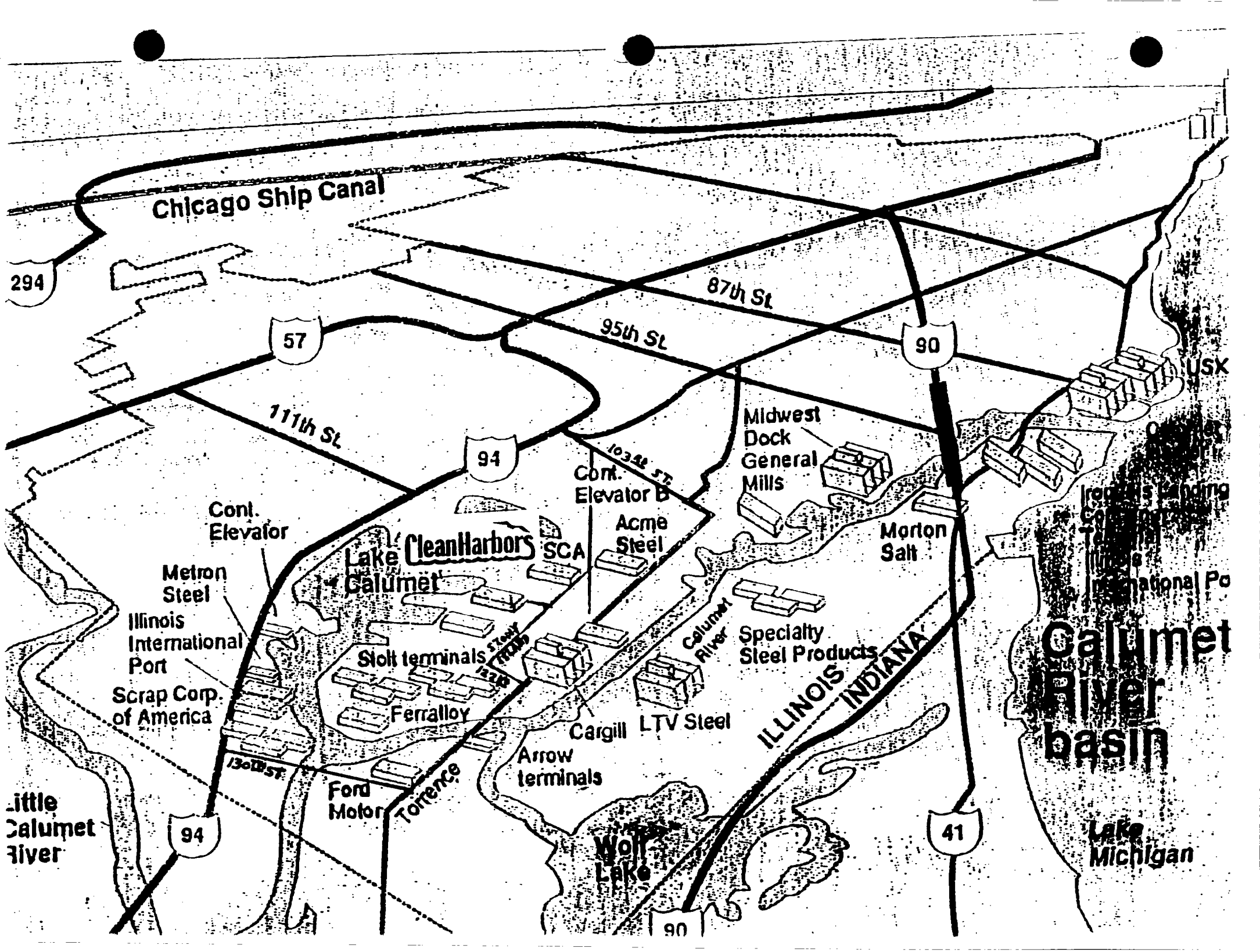




Northeast Illinois



018666 © The Rand H. Donnelley Corporation



Chicago Ship Canal
294
57
87th St.
95th St.
90
111th St.
94
103rd ST.
Cont. Elevator B
Midwest Dock General Mills
USX
Cont. Elevator
Metron Steel
Illinois International Port
Scrap Corp. of America
Lake Calumet
CleanHarbors
SCA
Acme Steel
Morton Salt
Stolt terminals
Ferralloy
Calumet River
Specialty Steel Products
ILLINOIS
INDIANA
Cargill
LTV Steel
Arrow terminals
130th ST.
Ford Motor
Torrence
Little Calumet River
94
Wolf Lake
41
Lake Michigan
Calumet River basin

Stony Is. Construct. Phasing

Oct. 1990 → May 1991

* Close Stony Is. between 116th St & 104th St. and maintain an 11 wide emerg lane.

* Begin construct. at 116th St and proceed North as far as time permits.

May 1991 → August 1991

* Close Stony Island ~~[illegible] St.~~, between 122nd St. & 116th St. Maint. Port Authority access at 122nd St. and CWM access to their driveway.

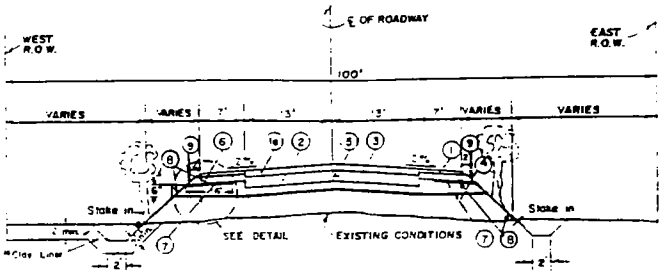
* Complete construct. in this area by August of 1991.

August 1991 → Sept. or Oct 1991

* Complete Northern portion of proje.

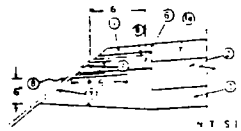
N
103rd St.
110TH ST
116TH ST
ke Calumet
Lendfill
122ND ST.

N
103rd St
110TH ST
116TH ST
ke Calumet
Lendfill
122ND ST



TYPICAL PROPOSED CROSS SECTION

STONY ISLAND AVE. - 122nd ST. TO 103rd ST.



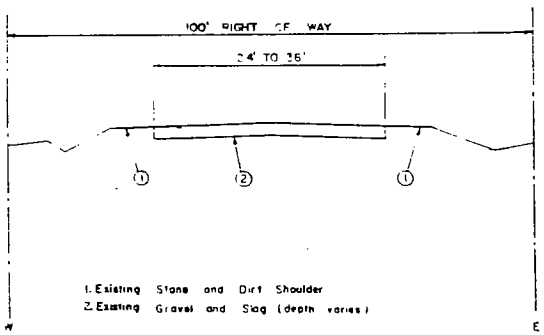
DETAIL

LEGEND

1. Bituminous Concrete Surface Course, Mixture D, Class I, 1 1/2 - Inch
2. Bituminous Concrete Surface Course, Mixture D, Class I, 1/2 and
3. Bituminous Concrete Binder Course, 1 1/2"
4. P.C. Concrete Base Course, 9-inch
5. Sub-base Granular Material Type B, 6-inch
6. Embankment (Variable depth, see cross sections)
7. Keyed Longitudinal Construction Joint
8. Aggregate Shoulder, Type B, 4 1/2 - Inch
9. Filter Fabric-as per Check Sheet #33 of the SSRBC dated July 1, 1988
10. Erosion Control Material
11. Delineators

NOTE Ditch and embankment slope varies. See cross sections.

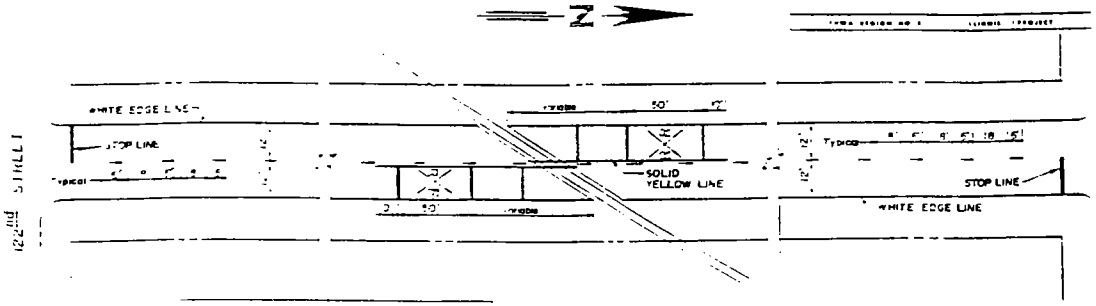
* Clay Liner only between Sta 82+50 and Sta 12+00



1. Existing Stone and Dirt Shoulder
2. Existing Gravel and Slag (depth varies)

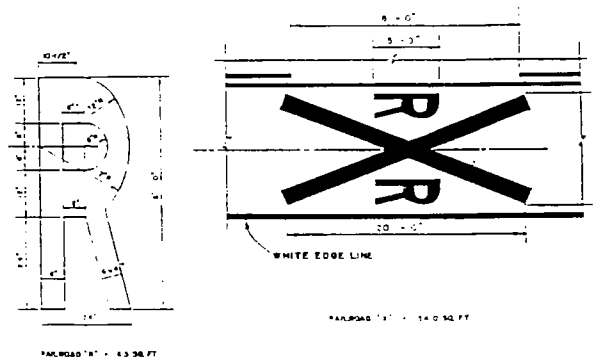
Typical Existing Cross Section

STONY ISLAND
122nd TO 103rd



LINE	WIDTH	COLOR	LENGTH
STOP LINE	24"	WHITE	
LANE LINE (SKIPDASH)	4"	YELLOW	
LANE LINE (SOLID)	4"	YELLOW	
EDGE LINE	4"	WHITE	

PAVEMENT MARKING PLAN



PAVEMENT MARKINGS AT GRADE CROSSING

STAGES OF CONSTRUCTION (See Specification Document Part I)

STAGE I

1. CLOSE STONY ISLAND AVE BETWEEN 122nd ST AND SCA CHEMICAL COMPANY'S DRIVEWAY AT APPROXIMATELY 117th ST
2. ACCESS TO LOCAL AND EMERGENCY VEHICLES WILL BE AVAILABLE THROUGH THE PORT AUTHORITY'S ENTRANCE AT 122nd ST AND FROM 103rd ST TO SCA CHEMICAL COMPANY'S DRIVEWAY. THE LOCAL ACCESS ROAD ON THE PORT AUTHORITY PROPERTY JUST - WEST OF STONY ISLAND WILL BE AVAILABLE FOR USE
3. COMPLETE CONSTRUCTION WORK

STAGE II

1. CLOSE STONY ISLAND AVE BETWEEN 103rd ST AND SCA CHEMICAL COMPANY'S DRIVEWAY TO LOCAL TRAFFIC
2. ESTABLISH AND MAINTAIN WITHIN THE EXISTING ROADWAY ONE 11'-0" WIDTH LANE FOR EMERGENCY VEHICLES ONLY, AT ALL TIMES BETWEEN 103rd ST AND THE WORK COMPLETED IN STAGE I
3. ACCESS TO LOCAL AND PORT AUTHORITY PROPERTIES WILL BE AVAILABLE THROUGH 122nd ST AND THE SECTION OF STONY ISLAND AVE COMPLETED IN STAGES I
4. COMPLETE CONSTRUCTION WORK

NOTE

FOR THE LOCATION OF ACCESS ROAD, SEE DETOUR ROUTE DRAWINGS IN PART II OF THE SPECIFICATION DOCUMENT

Charge SIMON A SIMON
Designed By R.E.H.
Drawn By G.M.
Checked By
Approved By S.A.S.

CITY OF CHICAGO
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING

S. STONY ISLAND AVENUE IMPROVE
122nd STREET TO 103rd STREE

TYPICAL CROSS SECTIONS AND PAVEMENT PLAN

Oak Lawn
Evergreen Park
Chicago Ridge
Worth
Palos Heights
Alsip
Blue Island
Calumet Park
Whiting
Hammond
East Chicago
Robbins
Riverdale
Dolton
Midlothian
Harvey
Calumet City
Oak Forest
Markham
Holland
Hammond
Gary
Tinley Park
Hazel Crest
Country Club Hills
Lansing
Homewood
Munster
Highland
Lynwood
Griffith
Lincoln Estates
Chicago Heights
Matteson
Park Forest
South Chicago Heights
Dyer
Schererville
Merrillville
LAKE CALUMET
LAKE
S
T
U
V
W
11
12
13
14
15
16
17
18
To Kentland
10 MILES
COPYRIGHT 1988 BY CHICAGO TRIBUNE

APPENDIX B-7

STONY ISLAND AVENUE CONSTRUCTION DETAILS

CONTRACT PLANS
FOR

S. STONY ISLAND AV. IMPROVEMENT

103RD STREET TO 122ND STREET

DPW NO. B-4-059 F.A. PROJECT NO. M-5000(285)

CITY SECTION NO.76-B6006-00-RP STATE JOB NO. C-88-101-80

F.A.U. ROUTE NO. 2934 STATE SECTION NO. 1980-223R

STRUCTURAL DESIGN INFORMATION

STRUCTURAL DESIGN TRAFFIC: 2,000 YEAR: 2009

PV = 25 % SU = 25 % MU = 50 %

ROAD/STREET CLASSIFICATION CLASS II

PERCENT OF STRUCTURAL DESIGN TRAFFIC IN DESIGN LANE

P = 0.50 S = 0.50 M = 0.50

TRAFFIC FACTOR TF = 6.35

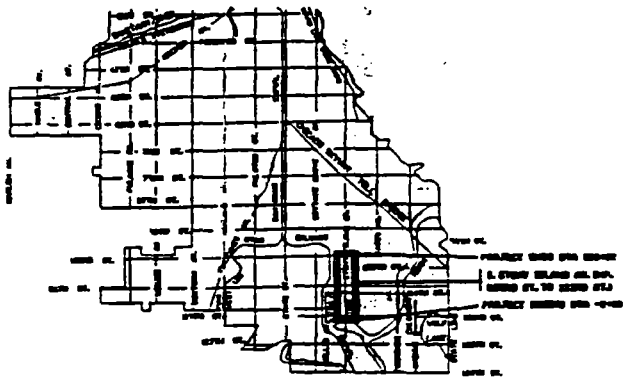
MINIMUM SOIL SUPPORT:

SSR = 5 (Sta. _____ to _____)

LSR = _____ (Sta. _____ to _____)

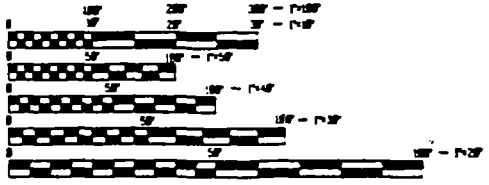
COMPOSITE PAVEMENT STRUCTURAL NUMBER:

SN_c = 3.85



LOCATION MAP

N



FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD ENGINEERING SCALES. REDUCED SIZED PLANS WILL NOT CONFORM TO STANDARD SCALES. IN MAKING MEASUREMENTS ON REDUCED PLANS, THE ABOVE SCALES MAY BE USED.

ISSUED BY: DEPARTMENT OF PURCHASES, CONTRACTS AND SUPPLIES
ALEXANDER GRZYB, PURCHASING AGENT

BUREAU OF ENGINEERING

APPROVED R.H. Nunn
ASSISTANT CHIEF ENGINEER
BUREAU OF ENGINEERING

APPROVED
DEPUTY COMMISSIONER
BUREAU OF TRAFFIC ENGINEERING AND OPERATIONS

APPROVED
CITY ENGINEER

APPROVED
COMMISSIONER

CITY OF CHICAGO
DEPARTMENT OF STREETS AND SANITATION

APPROVED
DEPUTY COMMISSIONER-BUREAU OF STREETS

APPROVED
DEPUTY COMMISSIONER-BUREAU OF ELECTRICITY

APPROVED
GENERAL SUPERINTENDENT-BUREAU OF FORESTRY

APPROVED
COMMISSIONER

CITY OF CHICAGO
DEPARTMENT OF WATER

APPROVED
CHIEF ENGINEER

APPROVED
COMMISSIONER

CITY OF CHICAGO
DEPARTMENT OF SEWERS

APPROVED MAR 6 7
DEPUTY COMMISSIONER

APPROVED MAR 8 7 5
COMMISSIONER

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PASSED _____ 19__

DISTRICT ENGINEER OF LOCAL ROADS & STREETS

APPROVED _____ 19__

DISTRICT ENGINEER

822

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

No. 7678
Date 4-16-90
PERMIT Supplimental
HAZ CODES D008

LAB ANALYSIS 5-18-90
OK ___ ACCEPT ✓ REJECT ___
PRICE ___
QUOTE ___

WASTE SOURCE
WASTE GENERATOR Avin
WASTE DESCRIPTION Treatment Sludge
RECEIPT DATE
VOLUME 15 ~~m~~ / week

WASTE CHARACTERISTICS

COLOR/APPEARANCE Tan Thick
WATER MISCIBILITY +
% FLOATER —
% OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
PH	9.1		Ag, ppm	0.08	
% TOTAL SOLIDS	50		As, ppm	<2.0	
% DISSOLVED SOLIDS			Ba, ppm	15.0	
% SUSPENDED SOLIDS	5.0		Cd, ppm	<1.0	
% SETTLEABLE SOLIDS			Cr, ppm	7.9	43
FLASH POINT °C	>200°F		Cr (Hex), ppm	ND	
OIL AND GREASE, ppm	1134		Cu, ppm	3.4	
PHENOLS, ppm	25		Hg, ppb	<3.0	
CHLORIDE, ppm			Ni, ppm	3.8	
BROMIDE, ppm			Pb, ppm	5840.0	332.0
PHOSPHATE, ppm (TOTAL)			Se, ppm	<2.0	
COD ppm	2400		Zn, ppm	21,600	
BOD ppm			Fe, ppm	2880	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			Tl ppm		
CYANIDE ppm (TOTAL)			NH_3	ND	
CYANIDE ppm (RELEASE)	<1.0				
SULFIDE ppm (TOTAL)			TOX, ppm		
SULFIDE ppm Acid	<10		TOC, ppm	690	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 1.7 mls 0.1 N NaOH : 10 mls sample
TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	70	70	IRON, ppm	3.1	10.6
% SOLIDS Produced by Weight	4.20	5.07	NICKEL, ppm	2.9	2.4
COD, ppm	16,800	12,000	ZINC, ppm	0.25	3.6
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.7	0.4
BORON, ppm			LEAD, ppm	0.47	0.48
CADMIUM, ppm	<0.1	<0.1	MERCURY, ppb	<3.0	<3.0
CHROMIUM (TOTAL), ppm	<0.1	<0.1	Tl, ppm		
CHROMIUM (HEX), ppm					

ACCEPTED: Catherine M. Peterson - Ass't Manager
REJECTED:

COMMENTS

California List
Yes ✓ No ___
Pb Please Check
Sent for G.C.

10-
10-4-90

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS _____
OK ___ ACCEPT ___ REJECT ___
PRICE _____
QUOTE _____

WASTE SOURCE
WASTE GENERATOR Pt of Nasik
WASTE DESCRIPTION Virgin Product HNO_3
RECEIPT DATE
VOLUME 8000 gal yr

WASTE CHARACTERISTICS

COLOR/APPEARANCE colorless
WATER MISCIBILITY +
% FLOATER —
% OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
PH	0.1		Ag, ppm	<0.2	
% TOTAL SOLIDS	<0.1		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	<0.2	
% SUSPENDED SOLIDS	<0.1		Cd, ppm	<0.2	
% SETTLEABLE SOLIDS			Cr, ppm	<0.2	
FLASH POINT °C	>200°F		Cr (Hex), ppm	ND	
OIL AND GREASE ppm	<1.0		Cu, ppm	<0.2	
PHENOLS ppm	<0.5		Hg, ppb	<3.0	
CHLORIDE ppm			Ni, ppm	<0.2	
BROMIDE ppm			Pb, ppm	<0.2	
PHOSPHATE ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	<400		Zn, ppm	<0.2	
BOD ppm			Fe, ppm	<0.2	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			Ti, ppm	<0.2	
CYANIDE ppm (TOTAL)	<1.0		NH	ND	
CYANIDE ppm (RELEASE)					
SULFIDE ppm (TOTAL)	<1.0		TOX ppm		
SULFIDE ppm			TOC ppm	<50	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 2636.0 mls 0.1 N NaOH : 10 ml Sample
TREATMENT WITH MIX TANK (1 ml WASTE + 99 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	23	26	IRON, ppm	16.0	12.0
% SOLIDS Produced by Weight	1.06	1.23	NICKEL, ppm	3.0	2.8
COD, ppm	16,000	14,000	ZINC, ppm	6.0	4.0
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE) ppm			COPPER, ppm	0.1	0.1
BORON ppm			LEAD, ppm	0.23	0.29
CADMIUM ppm	<0.1	<0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	0.1	0.1	Tl ppm		
CHROMIUM (HEX), ppm					

ACCEPTED: Catherine Rubino / Asst Lab Manager
REJECTED:

COMMENTS

California List
Yes ___ No ✓
Please Check

[illegible] [illegible]
LOG IN [illegible]
PERMIT #
HAZ CODES D002

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS 3-19-90
OK ___ ACCEPT ✓ REJECT ___
PRICE
QUOTE

WASTE SOURCE
WASTE GENERATOR Amoco
WASTE DESCRIPTION Aluminum Chloride
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE Colorless
WATER MISCIBILITY +
% FLOATER —
% OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH.	TEST	As Rec.	EPT
PH	1.7		Ag, ppm	0.32	
% TOTAL SOLIDS	13.82		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	0.32	
% SUSPENDED SOLIDS	<0.1		Cd, ppm	<0.1	
% SETTLEABLE SOLIDS			Cr, ppm	<2.0	
FLASH POINT °C	>200°F		Cr (Hex), ppm	ND	
OIL AND GREASE, ppm	<1.0		Cu, ppm	<2.0	
PHENOLS, ppm	<2.0		Hg, ppb	<4	
CHLORIDE, ppm			Ni, ppm	2.0	
BROMIDE, ppm			Pb, ppm	1.4	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	7000		Zn, ppm	2.2	
BOD ppm			Fe, ppm	44.0	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			Tl ppm	2.94	
CYANIDE ppm (TOTAL)	<1.0		NH_3	ND	
CYANIDE, ppm (RELEASE)					
SULFIDE, ppm (TOTAL)	~~<1000~~		TOX, ppm		
SULFIDE ppm Rel	<10.0		TOC, ppm	320	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 320 mls 0.1 N NaOH : 10 ml sample
TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	50	80	IRON, ppm	1.2	0.8
% SOLIDS Produced by Weight	3.18	3.47	NICKEL, ppm	3.7	2.5
COD, ppm	19,200	16,000	ZINC, ppm	0.42	0.55
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.5	0.4
BORON, ppm			LEAD, ppm	0.43	0.23
CADMIUM, ppm	<0.1	<0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	0.2	0.2	Tl, ppm		
CHROMIUM (HEX), ppm					

ACCEPTED: REJECTED:

COMMENTS Catherine Rubino - Ass. Lab. Manager

California List
Yes ✓ No ___
Ph Please Check
Sent for G.C.

CHK # [illegible]

LOG # 5-12-90

PERMIT #

HAZ CODES D002

CLEANHARBORS

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS

OK ___ ACCEPT ✓ REJECT

PRICE

QUOTE

WASTE SOURCE

WASTE GENERATOR Thermos Co.

WASTE DESCRIPTION Strip Tank Sludge

RECEIPT DATE VOLUME 4500 mo.

WASTE CHARACTERISTICS

COLOR/APPEARANCE Grey Viscous

WATER MISCIBILITY +

% FLOATER few

% OIL ON ACIDIFICATION —

% FREE OIL

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
PH	13.5		Ag, ppm	0.3	
% TOTAL SOLIDS	38.63		As, ppm	<1.0	
% DISSOLVED SOLIDS			Ba, ppm	<2.0	
% SUSPENDED SOLIDS	0.56		Cd, ppm	<0.1	
% SETTLEABLE SOLIDS			Cr, ppm	9.6	0.36
FLASH POINT °C	>200°F		Cr (Hex), ppm	ND	
OIL AND GREASE ppm	736		Cu, ppm	10.6	
PHENOLS ppm	<2.0		Hg, ppb	<3.0	
CHLORIDE ppm			Ni, ppm	3.2	
BROMIDE, ppm			Pb, ppm	2.4	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<1.0	
COD ppm	248000		Zn, ppm	240	
BOD ppm			Fe, ppm	856	
ACIDITY mg/l as $CaCO_3$	80000				
ALKALINITY mg/l as $CaCO_3$	9		Tl ppm		
CYANIDE, ppm (TOTAL)			NH_3	ND	
CYANIDE, ppm (RELEASE)	<1.0				
SULFIDE, ppm (TOTAL)			TOX, ppm		
SULFIDE ppm Nil	<10		TOC, ppm	70400	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 69.0 mls 0.1 N H_2SO_4: 10 mls sample

TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	33	47	IRON, ppm	30.8	19.4
% SOLIDS Produced by Weight	0.48	1.2	NICKEL, ppm	0.8	1.3
COD, ppm	8800	12000	ZINC, ppm	0.24	0.45
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.13	0.19
BORON ppm			LEAD, ppm	0.27	0.43
CADMIUM ppm	<0.1	<0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	0.15	0.17	Tl, ppm		
CHROMIUM (HEX), ppm					

ACCEPTED Catherine Pitcher / Project Manager

REJECTED:

COMMENTS

California List

Yes ___ No ✓

Please Check

Sent for G.C.

CleanHarbors

[illegible] ENVIRONMENTAL SERVICES COMPANIES
[illegible]300 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6222

LAB ANALYSIS _____
OK ___ ACCEPT ___ REJECT ___
PRICE _____
QUOTE _____

[illegible] _____
[illegible] _____
[illegible] _____
[illegible] CODES K062

WASTE SOURCE
WASTE GENERATOR GTE CORP
WASTE DESCRIPTION PICKLE LIQUOR
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE LT. GREEN, CLEAR
WATER MISCIBILITY —
% FLOATER —
% OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	LIME NEUTRALIZE EPT
PH	2.5		Ag ppm	0.7	
% TOTAL SOLIDS	11.85		As ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	<0.1	
% SUSPENDED SOLIDS	0.61		Cd ppm	0.2	
% SETTLEABLE SOLIDS			Cr ppm	450	<0.1
FLASH POINT °C	>140°F		Cr (Hex), ppm	—	
OIL AND GREASE ppm	<1.0		Cu ppm	1.0	
PHENOLS ppm	<1.0		Hg ppb	<3	
CHLORIDE ppm			Ni ppm	0.6	
BROMIDE, ppm			Pb ppm	10.1	<0.1
PHOSPHATE, ppm (TOTAL)			Se ppm	<0.1	
COD ppm	4080		Zn, ppm	2420	
BOD ppm			Fe ppm	66,200	
ACIDITY mg/l as $CaCo_3$					
ALKALINITY mg/l as $CaCo_3$			T ppm	<1.0	
CYANIDE ppm (TOTAL)	<1.0		NH	ND	
CYANIDE ppm (RELEASE)					
SULFIDE ppm (TOTAL)	<10		TOX ppm		
SULFIDE ppm			TOC ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 340 ml 0.1 N NaOH
TREATMENT WITH MIX TANK (ml WASTE + ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume			IRON, ppm		
% SOLIDS Produced by Weight			NICKEL, ppm		
COD ppm			ZINC, ppm		
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE) ppm			COPPER, ppm		
BORON ppm			LEAD, ppm		
CADMIUM ppm			MERCURY ppb		
CHROMIUM (TOTAL), ppm			T ppm		
CHROMIUM (HEX), ppm					

ACCEPTED: REJECTED:

COMMENTS LIME NEUTRALIZE

California List
Yes _____ No ____
Please Check

Sent for G.C.

CHI # [illegible]

LOG IN 12/1/89

PERMIT #

HAZ CODES D001, D002, D007

Clean Harbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS

OK ___ ACCEPT ___ REJECT ___

PRICE

QUOTE

WASTE SOURCE: CHEM TECH SYSTEMS

WASTE GENERATOR: CHEM TECH SYSTEMS

WASTE DESCRIPTION

RECEIPT DATE

VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE: Black Thick

WATER MISCIBILITY: –

% FLOATER: –

% OIL ON ACIDIFICATION

% FREE OIL: –

TEST	As Rec.	LEACH.	TEST	As Rec.	EPT
PH	13.2		Ag, ppm	1.0	
% TOTAL SOLIDS	91.37		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	3.6	
% SUSPENDED SOLIDS	5.10		Cd, ppm	0.4	
% SETTLEABLE SOLIDS			Cr, ppm	360	360
FLASH POINT °C	>200°F		Cr (Hex), ppm	ND	
OIL AND GREASE, ppm			Cu, ppm	6400	
PHENOLS, ppm	6.25		Hg, ppb	<4.0	
CHLORIDE ppm			Ni, ppm	40	
BROMIDE, ppm			Pb, ppm	3.7	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	112,000		Zn, ppm	6400	
TOD, ppm			Fe, ppm	2400	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY, mg/l as $CaCO_3$	19.19%		Tl ppm	3.0	
CYANIDE, ppm (TOTAL)			NH_3	ND	
CYANIDE, ppm (RELEASE)	<1.05				
SULFIDE, ppm (TOTAL)	4847		TOX, ppm		
SULFIDE, ppm REACTIVE	4804		TOC, ppm	4014	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10): 190 mls of 0.1 N H_2SO_4

TREATMENT WITH MIX TANK: (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	3%	4%	IRON, ppm	22.0	33.0
% SOLIDS Produced by Weight	5.15	7.44	NICKEL, ppm	1.2	1.5
COD, ppm	14,200	17,400	ZINC, ppm	0.45	0.91
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.5	0.7
BORON, ppm			LEAD, ppm	0.26	0.25
CADMIUM, ppm	0.1	0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	0.6	[illegible]	Tl ppm		
CHROMIUM (HEX), ppm					

ACCEPTED:

REJECTED:

COMMENTS: [illegible] Laboratory Manager

California List

Yes ___ No ___

Please Check

Sent for G.C.

CHI # 6244
LOG IN 2-21-90
PERMIT #
HAZ CODES D029

Clean Harbors
ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS
OK ___ ACCEPT ✓ REJECT ___
PRICE
QUOTE

WASTE SOURCE Global Removal
WASTE GENERATOR Transport Service
WASTE DESCRIPTION Tank Cleaning
RECEIPT DATE
VOLUME 20 K gal

WASTE CHARACTERISTICS

COLOR/APPEARANCE Grey - Heavy Solids
WATER MISCIBILITY +
% FLOATER —
% OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
PH	6.6		Ag. ppm	0.22	
% TOTAL SOLIDS	0.53		As. ppm	0.1	
% DISSOLVED SOLIDS			Ba. ppm	0.82	
% SUSPENDED SOLIDS	0.30		Cd. ppm	0.2	
% SETTLEABLE SOLIDS			Cr. ppm	0.62	
FLASH POINT °C	>140°F		Cr (Hex). ppm	ND	
OIL AND GREASE ppm	435		Cu. ppm	0.84	
PHENOLS ppm	11.0		Hg. ppb	23.0	
CHLORIDE ppm			Ni. ppm	0.30	
BROMIDE ppm			Pb. ppm	0.88	
PHOSPHATE ppm (TOTAL)			Se. ppm	40.1	
COD ppm	3200		Zn. ppm	1.4	
BOD ppm			Fe. ppm	32.4	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			Ti ppm	<0.1	
CYANIDE ppm (TOTAL)			NH_3		
CYANIDE ppm (RELEASE)	<1.0				
SULFIDE ppm (TOTAL)			TOX. ppm		
SULFIDE ppm Sil	<10		TOC. ppm	6400	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 0.8 mls 0.1 N NaOH
TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	43	34	IRON. ppm	1.46	0.13
% SOLIDS Produced by Weight	2.67	2.66	NICKEL. ppm	1.25	1.09
COD. ppm	12,000	17,600	ZINC. ppm	0.14	0.27
CYANIDE (TOTAL). ppm			O&G. ppm		
CYANIDE (RELEASABLE). ppm			COPPER. ppm	0.10	0.10
BORON ppm			LEAD. ppm	0.46	0.46
CADMIUM ppm	0.1	0.1	MERCURY. ppb		
CHROMIUM (TOTAL). ppm	1.58	1.71	Tl. ppm		
CHROMIUM (HEX). ppm					

ACCEPTED [illegible] REJECTED:

COMMENTS Phenol + 1,1-Dichloroethylene Oxydation
H_2O_2 + NaOH ⟹ Phenol = <2.0 ppm
1,1-Dichloroethylene = <0.5

California List
Yes ___ No ✓
Please Check
Sent for G C

TENCO ENVIRON TAL LABORATORIES
1150 Junction Avenue - Schererville, Indiana 46375
1-219-322-2560 • 1-800-428-3311
Fax 1-219-322-0440

REPORT TO:
Doug Dexter
American Energy Products
3373 Melton Rd.
Portage, IN 46368

TRANSPORT SERVICE COMPANY

Date: 9/24/90
Recd: 8/31/90
WO #: 22-2819

Laboratory Smp ID No.:	AA19198						
DESCRIPTION: —> (Unless otherwise noted; results in parts per million - ppm). PARAMETERS: ↓	Wash Rack Water #0095.0461 8/29/90				Detection Limits	Regulatory Level (mg/L)	EPA HW Number
OLATILES-ZHE ORGANICS*							
nzene	ND				0.002 ppm	0.5	D018
rbon Tetrachloride	0.081				0.002 ppm	0.5	D019
lorobenzene	ND				0.002 ppm	100.0	D021
loroform	ND				0.002 ppm	6.0	D022
2-Dichloroethane	ND				0.002 ppm	0.5	D028
1-Dichloroethylene	2.205				0.002 ppm	0.7	D029
thyl Ethyl Ketone	ND				0.002 ppm	200.0	D035
trachloroethylene	ND				0.002 ppm	0.7	D039
richloroethylene	0.0299				0.002 ppm	0.5	D040
nyl Chloride	ND				0.002 ppm	0.2	D043

TENCO ENVIRONMENTAL LABORATORIES
1150 Junction Ave. - Schererville, Indiana 46375
1-219-322-2560 • 1-800-428-3311
Fax 1-219-322-0440

REPORT TO:

Doug Doxter
American Energy Products
6373 Melton Rd.
Portage, IN 46368

TRANSPORT SERVICE COMPANY

Date: 9/24/90
Recd: 8/31/90
WO #: 22-2819

Laboratory Smp ID No.:	AA19198						
DESCRIPTION: ---> (Unless otherwise noted; results in parts per million - ppm) PARAMETERS:	Wash Rack Water #0095.0461 8/29/90				Detection Limits	Regulatory Level (mg/L)	EPA HW Number
SEMI-VOLATILES-TCLP ORGANICS*							
Cresol, total	ND				0.002 ppm	200.0	D026
1,4-Dichlorobenzene	ND				0.002 ppm	7.5	D027
2,4-Dinitrotoluene	ND				0.002 ppm	0.13	D030
Hexachlorobenzene	ND				0.002 ppm	0.5	D032
Hexachlorobutadiene	ND				0.002 ppm	0.5	D033
Hexachlorethane	ND				0.002 ppm	3.0	D034
Nitrobenzene	ND				0.002 ppm	2.0	D036
Pentachlorophenol	ND				0.002 ppm	100.0	D037
Pyridine	ND				0.002 ppm	5.0	D038
2,4,5-Trichlorophenol	ND				0.002 ppm	400.0	D041
2,4,6-Trichlorophenol	ND				0.002 ppm	2.0	D042

X54
3-3-90
HAZ CODES D002,7

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS 3-23-90
OK ___ ACCEPT ✓ REJECT ___
PRICE ___
QUOTE ___

WASTE SOURCE
WASTE GENERATOR Allied Tube
WASTE DESCRIPTION Chromic Acid Waste
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE Brown-Orange WATER MISCIBILITY +
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	EPT
PH	1.2		Ag, ppm	0.1	
% TOTAL SOLIDS	1.7		As, ppm	0.1	
% DISSOLVED SOLIDS			Ba, ppm	0.8	
% SUSPENDED SOLIDS	<0.1		Cd, ppm	<0.1	
% SETTLEABLE SOLIDS			Cr, ppm	39300	
FLASH POINT °C	>200°F		Cr (Hex), ppm	14000	
OIL AND GREASE, ppm	<1.0		Cu, ppm	33.8	
PHENOLS, ppm	<3.0		Hg, ppb	<3.0	
CHLORIDE, ppm			Ni, ppm	4.6	
BROMIDE, ppm			Pb, ppm	4.2	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	1600		Zn, ppm	4080	
BOD, ppm			Fe, ppm	3364	
ACIDITY mg/l as $CaCO_3$	2.590				
ALKALINITY mg/l as $CaCO_3$			Tl, ppm	<0.2	
CYANIDE, ppm (TOTAL)	<1.0		NH_3	ND	
CYANIDE, ppm (RELEASE)					
SULFIDE, ppm (TOTAL)	<1.0		TOX, ppm		
SULFIDE, ppm			TOC, ppm	250	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 89.0 mls 0.1 N NaOH · 10 mls sample
TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	30	40	IRON, ppm	17.6	14.2
% SOLIDS Produced by Weight	1.40	1.76	NICKEL, ppm	3.5	3.2
COD, ppm	10,000	8000	ZINC, ppm	4.0	6.0
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	2.8	1.4
BORON, ppm			LEAD, ppm	0.46	0.30
CADMIUM, ppm	<0.1	<0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	7.1	12.9	Tl, ppm		
CHROMIUM (HEX), ppm					

ACCEPTED: [signature] REJECTED:

COMMENTS Pretreat—Cr^{+6} - reduce w/ Sodium Metabisulfite

California List
Yes ✓ No ___
PhCr Please Check
Sent for G.C.

CHI # 12 6300

LOG IN 4-30-90

PERMIT #

HAZ CODES D002,7

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS 5-18-90

OK ___ ACCEPT ✓ REJECT ___

PRICE

QUOTE

WASTE SOURCE

WASTE GENERATOR Tech Alloy

WASTE DESCRIPTION ADS Nitric

RECEIPT DATE

VOLUME 3,500 mD

WASTE CHARACTERISTICS

COLOR/APPEARANCE Green Clear

WATER MISCIBILITY —

% FLOATER —

% OIL ON ACIDIFICATION —

% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	EPT
PH	1.6		Ag, ppm	1.2	
% TOTAL SOLIDS	23.0		As, ppm	0.1	
% DISSOLVED SOLIDS			Ba, ppm	13.8	
% SUSPENDED SOLIDS	0.10		Cd, ppm	<0.1	
% SETTLEABLE SOLIDS			Cr, ppm	11,760	11,000
FLASH POINT °C	>200°F		Cr (Hex), ppm	ND	
OIL AND GREASE, ppm	<1.0		Cu, ppm	2400	
PHENOLS, ppm	<3.0		Hg, ppb	<3.0	
CHLORIDE, ppm			Ni, ppm	19,360	
BROMIDE, ppm			Pb, ppm	4.8	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	16000		Zn, ppm	11.4	
BOD, ppm			Fe, ppm	25,760	
ACIDITY mg/l as $CaCO_3$	26,490				
ALKALINITY, mg/l as $CaCO_3$			Tl, ppm	2.4	
CYANIDE, ppm (TOTAL)	<1.0		NH_3	20,000	
CYANIDE, ppm (RELEASE)					
SULFIDE, ppm (TOTAL)	<1.0		TOX, ppm		
SULFIDE, ppm			TOC, ppm	90	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 684.0 mls 0.1 N NaOH: 10 mls Sample

TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	40	40	IRON, ppm	6.0	0.5
% SOLIDS Produced by Weight	1.32	1.46	NICKEL, ppm	1.0	0.7
COD, ppm	8000	8000	ZINC, ppm	<0.1	<0.1
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.1	0.2
BORON, ppm			LEAD, ppm	0.32	0.49
CADMIUM, ppm	<0.1	<0.1	MERCURY, ppb	<3.0	<3.0
CHROMIUM (TOTAL), ppm	<0.1	0.3	Tl, ppm		
CHROMIUM (HEX), ppm					

ACCEPTED: [signature]

REJECTED:

COMMENTS Pretreat: Strip Ammonia

California List

Yes ✓ No ___

Please Check

Sent for G.C.

CHI # _____

LOG IN _____

PERMIT # _____

HAZ CODES 7002

CleanHarbors

[illegible]
11[illegible] S. Stony Island Avenue
Chicago, Illinois [illegible]
(312) 646-[illegible]

LAB ANALYSIS [illegible]
OK ___ ACCEPT ___ REJECT ___
PRICE [illegible]
QUOTE _____

WASTE SOURCE
WASTE GENERATOR WISCONSIN ELECTRIC POWER
WASTE DESCRIPTION AMMONIUM CITRIC ACID BOILER CLEANING
RECEIPT DATE VOLUME 62,000 GALS.

WASTE CHARACTERISTICS

COLOR/APPEARANCE CLEAR, YELLOW WATER MISCIBILITY +
% FLOATER ND % OIL ON ACIDIFICATION ND
% FREE OIL ND

TEST	As Rec.	LEACH.	TEST	As Rec.	TCLP
PH	1.7		Ag, ppm	5.6	0.21
% TOTAL SOLIDS			As, ppm	0.5	
% DISSOLVED SOLIDS			Ba, ppm	1.9	
% SUSPENDED SOLIDS	0.28		Cd, ppm	0.4	
% SETTLEABLE SOLIDS			Cr, ppm	33.7	0.82
FLASH POINT, °C	>140°F		Cr (Hex), ppm	—	
OIL AND GREASE ppm			Cu, ppm	82	
PHENOLS ppm	<1.0		Hg, ppb	<3	
CHLORIDE ppm			Ni, ppm	4631	
BROMIDE, ppm			Pb ppm	12.7	1.6
PHOSPHATE ppm (TOTAL)			Se, ppm	0.01	
COD ppm	6800		Zn, ppm	19.6	
BOD ppm			Fe, ppm	14,825	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			Tl, ppm		
CYANIDE ppm (TOTAL)	<1.0		NH_3	21,200	
CYANIDE ppm (RELEASE)					
SULFIDE ppm (TOTAL)	<1.0		TOX, ppm		
SULFIDE ppm			TOC ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 63.5 mls. of 0.1 N NaOH
TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + PRETREATED Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	28	26	IRON, ppm	6.0	6.8
% SOLIDS Produced by Weight	5.34	5.12	NICKEL, ppm	5.2	4.9
COD, ppm	8100	7400	ZINC, ppm	0.75	0.56
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	1.01	1.22
BORON ppm			LEAD, ppm	0.51	0.41
CADMIUM ppm	0.1	0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	1.07	0.98	Tl ppm		
CHROMIUM (HEX), ppm					

ACCEPTED REJECTED:

COMMENTS PRETREAT AMMONIA

California List
Yes _____ No _____
Please Check

Sent for G C

APPENDIX C-1, DATA SHEET #11

CHELATION-BREAKING ALKALINE - D002

CHI # _____

LOG IN _____

PERMIT # _____

HAZ CODES D002

Clean Harbors

[illegible] SERVICES COMPANIES
11[illegible] [illegible] Island Avenue
Chicago, Illinois 60617
(312) 646-[illegible]

[illegible]

OK [illegible]

PRICE _____

QUOTE _____

WASTE SOURCE

WASTE GENERATOR WISCONSIN ELECTRIC POWER

WASTE DESCRIPTION EDTA - CAUSTIC BOILER CLEANING

RECEIPT DATE _____ VOLUME 20,000 GAL.

WASTE CHARACTERISTICS

COLOR/APPEARANCE CLEAR, BLUE — WATER MISCIBILITY ✓

% FLOATER ND — % OIL ON ACIDIFICATION NO

% FREE OIL ND

TEST	As Rec.	LEACH.	TEST	As Rec.	TCLP.
PH	12.8		Ag, ppm	4.9	
% TOTAL SOLIDS	0.7		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	2.2	
% SUSPENDED SOLIDS	0.12		Cd, ppm	0.4	
% SETTLEABLE SOLIDS			Cr, ppm	26.0	2.7
FLASH POINT °C	>140°F		Cr (Hex), ppm	—	
OIL AND GREASE ppm	234		Cu, ppm	1387	
PHENOLS, ppm	<1.0		Hg, ppb	<3	
CHLORIDE ppm			Ni, ppm	841	
BROMIDE, ppm			Pb, ppm	14.0	2.2
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	16,400		Zn, ppm	75.0	
BOD ppm			Fe, ppm	11,521	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			Tl ppm		
CYANIDE, ppm (TOTAL)	<1.0		NH_3	ND	
CYANIDE, ppm (RELEASE)					
SULFIDE, ppm (TOTAL)	<1.0		TOX, ppm		
SULFIDE, ppm			TOC, ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 14 mls. of 0.1 N H_2SO_4

TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + PRETREATED Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	42	40	IRON, ppm	8.60	9.00
% SOLIDS Produced by Weight	2.82	2.75	NICKEL, ppm	6.20	7.40
COD, ppm	3400	3800	ZINC, ppm	0.25	0.26
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	1.04	0.95
BORON ppm			LEAD, ppm	0.34	0.29
CADMIUM ppm	<0.1	<0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	1.16	1.17	Tl ppm		
CHROMIUM (HEX), ppm					

ACCEPTED _____ REJECTED: _____

COMMENTS PRETREAT EDTA

California List

Yes _____ No _____

Please Check

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CH: #

LOG IN

PERMIT #

HAZ CODES D008

Clean Harbors

11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS

PRIORITY

QUOTE

WASTE SOURCE

WASTE GENERATOR: IOWA ELECTRIC

WASTE DESCRIPTION: EDTA BOILER CLEANOUT

RECEIPT DATE

VOLUME: 20,000 GALS

WASTE CHARACTERISTICS

COLOR/APPEARANCE: MAROON - THIN

WATER MISCIBILITY: +

% FLOATER: —

% OIL ON ACIDIFICATION: —

% FREE OIL: —

TEST	As Rec.	LEACH.	TEST	As Rec.	TCLP
PH	9.3		Ag, ppm	0.30	
% TOTAL SOLIDS	13.42		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	1.58	
% SUSPENDED SOLIDS	0.3		Cd, ppm	0.2	
% SETTLEABLE SOLIDS			Cr, ppm	3.56	
FLASH POINT °C			Cr (Hex), ppm	—	
OIL AND GREASE ppm	176		Cu, ppm	23.2	
PHENOLS ppm	0.5		Hg, ppb	<3	
CHLORIDE ppm			Ni, ppm	600	
BROMIDE, ppm			Pb, ppm	120	82.2
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	69,600		Zn, ppm	176	
BOD, ppm			Fe, ppm	12,640	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			Tl ppm		
CYANIDE, ppm (TOTAL)	<1.0		NH_3	17,000	
CYANIDE, ppm (RELEASE)					
SULFIDE, ppm (TOTAL)	<1.0		TOX, ppm		
SULFIDE, ppm			TOC, ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10): 6.4 mls of 0.1 N NaOH

TREATMENT WITH MIX TANK: (10 ml WASTE + 40 ml MIX TANK)

TEST	MIX TANK	MIX + PRETREATED Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	50	58	IRON, ppm	5.80	5.50
% SOLIDS Produced by Weight			NICKEL, ppm	5.60	7.16
COD, ppm	19,200	23,400	ZINC, ppm	0.45	0.40
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.63	1.40
BORON ppm			LEAD, ppm	0.46	0.45
CADMIUM ppm	0.1	<0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	1.24	1.41	Tl ppm		
CHROMIUM (HEX) ppm					

ACCEPTED

REJECTED:

COMMENTS: PRETREAT AMMONIA — EDTA

California Lis

Yes ____ No ____

Please Chec

Sent for G C

APPENDIX C-1, DATA SHEET #13

ORGANIC STRIPPING - D018 - D043

CHI # 5186
6-18
D002, D039

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS
OK ___ ACCEPT ✓ REJECT
PRICE
QUOTE

WASTE SOURCE
WASTE GENERATOR Lomac
WASTE DESCRIPTION OZ-1
RECEIPT DATE
VOLUME 15,000 gal/week

WASTE CHARACTERISTICS

COLOR/APPEARANCE Yellow-Clear
WATER MISCIBILITY +
% FLOATER —
% OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
PH	0.7		Ag ppm	<0.1	
% TOTAL SOLIDS	1.0		As ppm	<0.1	
% DISSOLVED SOLIDS			Ba ppm	0.2	
% SUSPENDED SOLIDS	0.33		Cd ppm	<0.1	
% SETTLEABLE SOLIDS			Cr ppm	2.2	
FLASH POINT °C	>200°F		Cr (hex) ppm	ND	
OIL AND GREASE ppm	<1.0		Cu ppm	0.4	
PHENOLS ppm	<1.0		Hg ppb	7.0	
CHLORIDE ppm			Ni ppm	4.2	
BROMIDE ppm			Pb ppm	0.1	
PHOSPHATE ppm (TOTAL)			Se ppm	<0.1	
COD ppm	26,000		Zn ppm	0.71	
BOD ppm			Fe ppm	50.0	
ACIDITY mg/l as $CaCO_3$	380,000				
ALKALINITY mg/l as $CaCO_3$			Ti ppm	<0.2	
CYANIDE ppm (TOTAL)	<1.0		NH	ND	
CYANIDE ppm (RELEASE)					
SULFIDE ppm (TOTAL)	<1.0		TOX ppm		
SULFIDE ppm			TOC ppm	1000	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 1087 mls 0.1 N NaOH: 10 mls sample
TREATMENT WITH MIX TANK (5 ml WASTE + 95 ml MIX TANK)

TEST	MIX TANK	MIX Sample 5%		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	45	56	IRON ppm	42.0	18.0
% SOLIDS Produced by Weight	0.51	1.10	NICKEL ppm	4.1	3.1
COD ppm	8000	8800	ZINC ppm	0.53	2.2
CYANIDE (TOTAL) ppm			O&G ppm		
CYANIDE (RELEASABLE) ppm			COPPER ppm	0.3	1.0
BORON ppm			LEAD ppm	0.37	0.47
CADMIUM ppm	0.1	0.1	MERCURY ppb 100%	<3.0	<3.0
CHROMIUM (TOTAL) ppm	2.8	2.7	Ti ppm		
CHROMIUM (HEX) ppm					

ACCEPTED
REJECTED

COMMENTS

California List
Yes ___ No ✓
Please Check

Sent for G.C.

ANALYTICAL SERVICES

CLIENT: Lomac, Inc.
PROJECT: Full TCLP Rush
ASI REF. NO.: 03187
SAMPLED BY: RA
DESCRIPTION: Liquid Sample
ANALYST: JG, JY

DATE SAMPLED: 10/26/90
DATE RECEIVED: 10/29/90
DATE FINISHED: 11/01/90
REPORT DATE: 11/02/90

ASI SAMPLE I.D.:	5044	REGULATORY LIMIT	LIMIT OF DETECTION
CLIENT SAMPLE I.D.:	08-1		
VOLATILES			
BENZENE	ND	0.5	1.2
CARBON TETRACHLORIDE	ND	0.5	1.2
CHLOROBENZENE	ND	100	1.2
CHLOROFORM	ND	6	1.2
1,4-DICHLOROBENZENE	ND	7.5	1.2
1,2-DICHLOROETHANE	ND	0.5	1.2
1,1-DICHLOROETHYLENE	ND	0.7	1.2
METHYL ETHYL KETONE	ND	200	12
PYRIDINE	ND	5	120
TETRACHLOROETHENE	48	0.7	1.2
TRICHLOROETHENE	ND	0.5	1.2
VINYL CHLORIDE	ND	0.2	2.5
SEMI VOLATILES and PESTICIDES			
CHLORDANE	ND	0.03	0.2
o-CRESOL	ND	200	.1
m-CRESOL	ND	200	0.1
p-CRESOL	ND	200	0.1
TOTAL CRESOL	ND	200	0.1
2,4-DINITROTOLUENE	ND	0.13	0.02
ENDRIN	ND	0.02	0.1
HEPTACHLOR	ND	0.008	0.01
HEXACHLOROBENZENE	ND	0.13	0.1
HEXACHLOROBUTADIENE	ND	0.5	0.1
HEXACHLOROETHANE	ND	3	0.1
gamma-BHC (LINDANE)	ND	0.4	0.1
METHOXYCHLOR	ND	10	0.1
NITROBENZENE	ND	2	0.1
PENTACHLOROPHENOL	ND	100	0.1
TOXAPHENE	ND	0.5	2.2
2,4,5-TRICHLOROPHENOL	ND	400	0.1
2,4,6-TRICHLOROPHENOL	ND	2	0.1
HERBICIDES			
2,3-D	ND	10	0.5
2,4,5-TP (Silvex)	ND	1	0.2

ND = Non Detectable
Results are in mg/L

Gerald T. Skar
Laboratory Director
cpr

Re 605
12-20

MIT #

HAZ CODES

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS 1-5-90
OK ___ ACCEPT ___ REJECT ___
PRICE
QUOTE

WASTE SOURCE
WASTE GENERATOR Bexnord
WASTE DESCRIPTION Coolant Oil and Water
RECEIPT DATE
VOLUME 60,000 gr

WASTE CHARACTERISTICS

	Bottom	Top (oil)		Bottom	Top
COLOR/APPEARANCE	grey	Brown	WATER MISCIBILITY	+	—
% FLOATER	oil	10-15%	% OIL ON ACIDIFICATION	12-13%	
% FREE OIL	10-15%				

TEST	BI	As Rec.	LEACH	TEST	As Rec.	EPT
PH	8.6			Ag, ppm	0.2	
% TOTAL SOLIDS	4.2	oil		As, ppm	<0.1	
% DISSOLVED SOLIDS				Ba, ppm	8.0	
% SUSPENDED SOLIDS	0.1	oil		Cd, ppm.	3.34	0.07
% SETTLEABLE SOLIDS				Cr, ppm	0.30	
FLASH POINT °C				Cr (Hex), ppm	NO	
OIL AND GREASE, ppm		7600		Cu, ppm	8.4	
PHENOLS, ppm		5.0		Hg, ppb	<4	
CHLORIDE, ppm				Ni, ppm	0.66	
[illegible]MIDE, ppm				Pb, ppm	<0.1	
[illegible]SPHATE, ppm (TOTAL)				Se, ppm	<0.1	
COD ppm		64000		Zn, ppm	5.6	
BOD ppm				Fe, ppm	56	
ACIDITY mg/l as $CaCo_3$						
ALKALINITY mg/l as $CaCo_3$				Tl ppm	<0.1	
CYANIDE ppm (TOTAL)				NH_3 +	840	
CYANIDE ppm (RELEASE)		<1.0				
SULFIDE ppm (TOTAL)				TOX ppm		
SULFIDE ppm	oil	<1.0		TOC, ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 7.6 ml S. 1 N NaOH
TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	50	50	IRON, ppm	10.0	13.0
% SOLIDS Produced by Weight	[illegible]	[illegible]	NICKEL, ppm	2.2	2.1
COD, ppm	16000	14400	ZINC, ppm	2.2	1.6
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	4.0	4.4
BORON ppm			LEAD, ppm	0.30	0.19
CADMIUM ppm	0.1	0.8	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	1.6	1.8	Tl, ppm		
CHROMIUM (HEX), ppm					

ACCEPTED:
REJECTED:

COMMENTS For Repermitting

Mike Rathmel

California List
Yes ___ No ✓
Please Check

CH # _____

LOC # _____

PERMIT # _____

Z CODES D001 (OXIDIZER) D002

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS _____

OK ___ ACCEPT ___ REJECT ___

PRICE _____

QUOTE _____

WASTE SOURCE

WASTE GENERATOR DRESSER INDS

WASTE DESCRIPTION NITRIC STRIPPER

RECEIPT DATE VOLUME 6 DR/QTR

WASTE CHARACTERISTICS

COLOR/APPEARANCE CLEAR - COLORLESS WATER MISCIBILITY +

% FLOATER — % OIL ON ACIDIFICATION —

% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	EPT
PH	0.5		Ag, ppm	<0.2	
% TOTAL SOLIDS	1.21		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	<0.2	
% SUSPENDED SOLIDS	<0.1		Cd ppm	<0.2	
% SETTLEABLE SOLIDS			Cr ppm	4.2	
FLASH POINT °C	>140		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	<10		Cu, ppm	141	
PHENOLS ppm	<1.0		Hg, ppb	<3	
CHLORIDE ppm			Ni ppm	68	
BROMIDE, ppm			Pb, ppm	2.8	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	300		Zn, ppm	224	
TOD ppm			Fe ppm	1250	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			Tl ppm	<0.2	
CYANIDE ppm (TOTAL)	<1.0		N.H.	ND	
CYANIDE ppm (RELEASE)					
SULFIDE ppm (TOTAL)	<1.0		TOX ppm		
SULFIDE ppm			TOC ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 2010 ml 0.1 N NaOH

TREATMENT WITH MIX TANK (10 ml WASTE + 40 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	60	65	IRON, ppm	20.0	14.0
% SOLIDS Produced by Weight	1.34	1.48	NICKEL, ppm	2.0	2.3
COD ppm			ZINC, ppm	1.0	1.0
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.2	0.1
BORON ppm			LEAD, ppm	0.49	0.46
CADMIUM ppm	<0.1	0.1	MERCURY ppb		
CHROMIUM (TOTAL), ppm	0.2	0.2	Tl ppm		
CHROMIUM (HEX), ppm					

ACCEPTED: REJECTED:

COMMENTS NEUTRALIZE

California List

Yes _____ No _____

Please Check

Sent for G.C.

CHI # _____

LOG IN _____

PERMIT # _____

RCRA CODES D002

Clean Harbors

ENVIRONMENTAL SERVICES COMPANIES

11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS _____

DISPOSAL ACCEPT _____

PRICE _____

QUOTE _____

WASTE SOURCE

WASTE GENERATOR RELIABLE GALVANIZING

WASTE DESCRIPTION SPENT SULFURIC ACID PLATING BATH

RECEIPT DATE VOLUME 60,000 / YR

WASTE CHARACTERISTICS

COLOR/APPEARANCE CLEAR, LIGHT GREEN

WATER MISCIBILITY +

% FLOATER —

% OIL ON ACIDIFICATION —

% FREE OIL —

TEST	As Rec.	LEACH.	TEST	As Rec.	TCLP
PH	0.4		Ag, ppm	0.16	
% TOTAL SOLIDS	21.16		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	0.25	
% SUSPENDED SOLIDS	0.23		Cd, ppm	0.5	
% SETTLEABLE SOLIDS	<1.0		Cr ppm	1.8	
FLASH POINT °C	>140°F		Cr (Hex), ppm	—	
OIL AND GREASE ppm	ND		Cu, ppm	1.8	
PHENOLS, ppm	1.4		Hg, ppb	<3	
CHLORIDE ppm			Ni, ppm	14.0	
BROMIDE, ppm			Pb, ppm	2.0	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	9477		Zn, ppm	8000	
BOD ppm			Fe, ppm	28,000	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY, mg/l as $CaCO_3$			Tl ppm		
CYANIDE ppm (TOTAL)	<1.0		NH_3	ND	
CYANIDE, ppm (RELEASE)					
SULFIDE, ppm (TOTAL)	<1.0		TOX, ppm		
SULFIDE, ppm			TOC, ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 354.0 mL 0.1 N NaOH

TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	55	66	IRON, ppm	5.7	9.0
% SOLIDS Produced by Weight	0.71	1.26	NICKEL, ppm	1.2	1.4
COD, ppm			ZINC, ppm	5.0	7.5
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.2	0.2
BORON ppm			LEAD, ppm	0.20	0.25
CADMIUM ppm	0.1	0.2	MERCURY ppb		
CHROMIUM (TOTAL), ppm	0.40	0.49	Tl ppm		
CHROMIUM (HEX), ppm					

ACCEPTED

REJECTED:

COMMENTS

California List

Yes ____ No ____

Please Check

Sent for G C

CHI # _____

LOG IN _____

PERMIT # _____

HAZ CODES 0003

Clean Harbors

11800 S. Stony [illegible]
Chicago, Illinois [illegible]
(312) [illegible]

LAB ANALYSIS [illegible]
OK ___ ACCEPT ___ [illegible]ECT ___
PRICE [illegible]
QUOTE _____

WASTE SOURCE	
WASTE GENERATOR	CRAFTSMEN PLATING
WASTE DESCRIPTION	ELECTROPLATING SLUD[illegible]
RECEIPT DATE	VOLUME 5000 GALS./MO.

WASTE CHARACTERISTICS

COLOR/APPEARANCE	GREY SLURRY	WATER MISCIBILITY	+
% FLOATER	—	% OIL ON ACIDIFICATION	—
% FREE OIL	—		

TEST	As Rec.	LEACH.	TEST	As Rec.	TCLP
PH	9.8		Ag, ppm	<2.0	
% TOTAL SOLIDS	5.84		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	0.1	
% SUSPENDED SOLIDS	2.31		Cd, ppm	0.1	
% SETTLEABLE SOLIDS			Cr, ppm	2.0	
FLASH POINT °C	>140°F		Cr (Hex), ppm	—	
OIL AND GREASE ppm			Cu, ppm	66.0	
PHENOLS ppm	<1.0		Hg, ppb	<3	
CHLORIDE ppm			Ni, ppm	156	
BROMIDE, ppm			Pb, ppm	2.0	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	12,000		Zn, ppm	4080	
BOD ppm			Fe, ppm	12.0	
ACIDITY mg/l as $CaCo_3$					
ALKALINITY mg/l as $CaCo_3$			Tl, ppm		
CYANIDE, ppm (TOTAL)	600		NH_3	NO	
CYANIDE, ppm (RELEASE)					
SULFIDE, ppm (TOTAL)			TOX, ppm		
SULFIDE, ppm	<1.0		TOC, ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 0.3 [illegible] 0.1 N NaOH

TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + PRETREATED Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	50	53	IRON, ppm	16.0	13.8
% SOLIDS Produced by Weight	1.67	1.09	NICKEL, ppm	6.0	6.0
COD, ppm			ZINC, ppm	3.0	2.0
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.20	0.38
BORON ppm			LEAD, ppm	0.64	0.6[illegible]
CADMIUM ppm	0.1	0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	1.0	1.5	Tl ppm		
CHROMIUM (HEX), ppm					

ACCEPTED _____ REJECTED: _____

COMMENTS OXIDIZE CN^- w/ H_2O_2

California Lis[illegible]
Yes _____ No _____
Please Check

Sent for G.C.

CHI # _____

LOG IN _____

PERMIT # _____

HAZ CODES D007

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES

11600 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS

OK ACCEPT ___ REJECT ___

PRICE _____

QUOTE _____

WASTE SOURCE

WASTE GENERATOR HOBART

WASTE DESCRIPTION CHROME PLATING ~~BATHS~~

RECEIPT DATE VOLUME 12,000 GALS/YR

WASTE CHARACTERISTICS

COLOR/APPEARANCE ORANGE - CLEAR / HEXCHROME WATER MISCIBILITY —

% FLOATER — % OIL ON ACIDIFICATION —

% FREE OIL —

TEST	As Rec.	LEACH.	TEST	As Rec.	TCLP
PH	2.1		Ag, ppm	6.0	1.4
% TOTAL SOLIDS	2.17		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	6.2	
% SUSPENDED SOLIDS	0.004		Cd, ppm	0.2	
% SETTLEABLE SOLIDS			Cr, ppm	10,400	
FLASH POINT °C	>140°F		Cr (Hex), ppm	8450	
OIL AND GREASE ppm	<1.0		Cu, ppm	36.0	
PHENOLS ppm	0.5		Hg, ppb	<3	
CHLORIDE ppm			Ni, ppm	400	
BROMIDE ppm			Pb, ppm	4.19	
PHOSPHATE ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	80.0		Zn, ppm	5.0	
BOD ppm			Fe, ppm	240.0	
ACIDITY mg/l as $CaCo_3$					
ALKALINITY mg/l as $CaCo_3$			Tl ppm		
CYANIDE ppm (TOTAL)	<2.0		NH_3	ND	
CYANIDE, ppm (RELEASE)					
SULFIDE ppm (TOTAL)	<1.0		TOX, ppm		
SULFIDE ppm			TOC, ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 21.0 ml. 0.1N NaOH

TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + PRETREATED Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	61	62	IRON, ppm	8.0	8.7
% SOLIDS Produced by Weight	0.36	0.72	NICKEL, ppm	5.0	3.3
COD, ppm	18400	16400	ZINC, ppm	1.8	0.6
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	<0.1	0.1
BORON ppm			LEAD, ppm	0.54	0.53
CADMIUM ppm	0.1	0.1	MERCURY ppb		
CHROMIUM (TOTAL), ppm	0.4	0.3	Tl ppm		
CHROMIUM (HEX) ppm					

ACCEPTED REJECTED:

COMMENTS PRETREAT HEXCHROME

California Lis

Yes ____ No ___

Please Chec

Sent for G C

[illegible] 11-12-90

PERMIT #

[illegible] CODES D035, D002, D007

Central Dot

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

OK ___ ACCEPT ✓ REJECT ___

PRICE

QUOTE

WASTE SOURCE

WASTE GENERATOR [illegible]

WASTE DESCRIPTION Alodine Etch Solution

RECEIPT DATE

VOLUME 15,000

WASTE CHARACTERISTICS

COLOR/APPEARANCE Green - Thin

WATER MISCIBILITY +

% FLOATER no

% OIL ON ACIDIFICATION —

% FREE OIL no

TEST	As Rec	LEACH	TEST	As Rec.	TCLP
PH	2.0		Ag ppm	<0.1	
% TOTAL SOLIDS	3.78		As ppm	<0.1	
% DISSOLVED SOLIDS			Ba ppm	<0.1	
% SUSPENDED SOLIDS	<0.1		Cd ppm	<0.1	
% SETTLEABLE SOLIDS			Cr ppm	822	130
FLASH POINT °C	>100°F		Cr (Hex) ppm	ND	
OIL AND GREASE ppm	<1.0		Cu ppm	0.78	
PHENOLS ppm			Hg ppm	<3.0	
CHLORIDE ppm			Ni ppm	0.30	
BROMIDE ppm			Pb ppm	0.34	
PHOSPHATE ppm TOTAL			Se ppm	<0.1	
COD ppm	<800		Zn ppm	0.50	
BOD ppm			Fe ppm		
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			[illegible] ppm	0.44	
CYANIDE ppm (TOTAL	<1.0		[illegible]	ND	
CYANIDE ppm (RELEASE					
SULFIDE ppm (TOTAL)	<1.0		TOX ppm		
SULFIDE ppm			TOC ppm	1100	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 50.0 mls 0.1 N NaOH: 10 mls sample

TREATMENT WITH MIX TANK 10 ml WASTE + 90 ml MIX TANK

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	70	70	IRON, ppm	1.66	1.5[illegible]
% SOLIDS Produced by Weight	3.0	2.9	NICKEL, ppm	2.4	2.[illegible]
COD ppm	18,000	18,800	ZINC, ppm	0.18	0.1[illegible]
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE) ppm			COPPER ppm	1.4	1.0
BORON ppm			LEAD, ppm	0.33	0.3[illegible]
CADMIUM ppm	<0.1	<0.1	MERCURY ppb		
CHROMIUM (TOTAL), ppm	0.12	0.12	[illegible] ppm		
CHROMIUM (HEX), ppm					

ACCEPTED [signature] [signature] REJECTED

COMMENTS Pretreat — MEK Oxydation - $FeSO_4$ + H_2O_2

MEK = <2000 ppm

California List

Yes ___ No ✓

Please Check

Sent for G C

TEST RESULTS BY SAMPLE

Sample: 01A EK6332 ALODINE ETCH Collected: 10/04/90
Job: TCLP_I TCLP Inorganic

Test Description	Result	Limit	Units	Analyz
TCLP (Arsenic)	0.06	5.0	mg/l	10/26/
TCLP (Barium)	0.61	100.0	mg/l	10/23/
TCLP (Cadmium)	* 2.6	1.0	mg/l	10/23/
TCLP (Chromium)	** 130	5.0	mg/l	10/23/
TCLP (Copper)	0.89	100	mg/l	10/23/
TCLP (Lead)	0.5	5.0	mg/l	10/23/
TCLP (Mercury)	< 0.001	0.2	mg/l	10/26/
TCLP (Nickel)	0.17	35	mg/l	10/23/
TCLP (Selenium)	< 0.010	1.0	mg/l	10/26/
TCLP (Silver)	< 0.05	5.0	mg/l	10/23/
TCLP (Zinc)	4.1	200	mg/l	10/23/
TCLP Inorganic Extraction	-		-	10/23/

Sample: 01B EK6332 ALODINE ETCH Collected: 10/04/90
Job: TCLP_O TCLP Organic

Test Description		Result	Limit	Units	Analyze
8240 TCLP					
Benzene	#	< 500	500	ppb	11/14/9
Methyl Ethyl Ketone	#	390000	200000	ppb	11/14/9
Carbon tetrachloride	#	< 500	500	ppb	11/14/9
Chlorobenzene	#	< 500	100000	ppb	11/14/9
Chloroform	#	< 500	6000	ppb	11/14/9
1,2-Dichloroethane	#	< 500	500	ppb	11/14/9
1,4-Dichlorbenzene	#	< 1000	7500	ppb	11/14/9
1,1-Dichloroethene	#	< 500	700	ppb	11/14/9
Tetrachloroethene	#	< 500	700	ppb	11/14/9
Trichloroethene	#	< 500	500	ppb	11/14/9
Pyridine	#	<5000	5000	ppb	11/14/9
Vinyl Chloride	#	< 1000	200	ppb	11/14/9
8270 TCLP					
2,4-Dinitrotoluene		< 10	130	ppb	11/08/9
Hexachlorobenzene		< 10	130	ppb	11/08/9
Hexachloro-1,3-butadiene		< 10	500	ppb	11/08/9
Hexachloroethane		< 10	3000	ppb	11/08/9
Cresol (Total)		< 10	200000	ppb	11/08/9
Nitrobenzene		< 10	2000	ppb	11/08/9
Pentachlorophenol		< 50	100000	ppb	11/08/9
2,4,5-Trichlorophenol		< 10	400000	ppb	11/08/9
2,4,6-Trichlorophenol		< 10	2000	ppb	11/08/9
TCLP ZHE VOC Extraction		-		-	11/07/9

LOT # _____

PERMIT # _____

HAZ CODES F003

Ecaillat Inc

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

OK ___ ACCEPT ___ REJECT ___

PRICE _____

QUOTE _____

WASTE SOURCE: HI-GRADE ALLOY

WASTE GENERATOR:

WASTE DESCRIPTION: WASHWATER W/ ALCOHOL

RECEIPT DATE: VOLUME: 2000 GAL/WK

WASTE CHARACTERISTICS

COLOR/APPEARANCE	WHITE CLOUDY SLURRY	WATER MISCIBILITY	✓
% FLOATER	NO	% OIL ON ACIDIFICATION	✓
% FREE OIL	NO		

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
PH	7.4		Ag. ppm	0.1	
% TOTAL SOLIDS	2.65		As. ppm	<0.1	
% DISSOLVED SOLIDS			Ba. ppm	<0.1	
% SUSPENDED SOLIDS	2.16		Cd ppm	<0.1	
% SETTLEABLE SOLIDS	<1		Cr ppm	1.5	
FLASH POINT °C	>140°F		Cr (hex) ppm	ND	
OIL AND GREASE ppm	3400		Cu. ppm	2.0	
PHENOLS ppm			Hg. ppb	<3.0	
CHLORIDE ppm			Ni ppm	0.1	
BROMIDE. ppm			Pb ppm	0.25	
PHOSPHATE. ppm (TOTAL)			Se. ppm	<0.1	
COD ppm	39,318		Zn. ppm	90.0	
BOD ppm			Fe ppm	10.0	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			T ppm		
CYANIDE ppm (TOTAL)	<1		NH ppm	ND	
CYANIDE ppm (RELEASE)					
SULFIDE ppm (TOTAL)			TOX ppm		
SULFIDE ppm			TOC ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 1.75 mL NaOH

TREATMENT WITH MIX TANK (10 ml WASTE + 10 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	65	45	IRON ppm	6.6	6.6
% SOLIDS Produced by Weight	1.73	3.77	NICKEL. ppm	1.2	1.4
COD ppm			ZINC. ppm	6.2	3.0
CYANIDE (TOTAL). ppm			O&G. ppm		
CYANIDE (RELEASABLE) ppm			COPPER ppm	0.3	0.4
BORON ppm			LEAD. ppm	0.25	<0.2
CADMIUM ppm	<0.1	<0.1	MERCURY ppb	<3	<3
CHROMIUM (TOTAL). ppm	1.0	1.2	Tl ppm		
CHROMIUM (HEX). ppm					

ACCEPTED _____ REJECTED _____

COMMENTS

ACETONE NITRILE	22 983	PPM
ACETONE	1.5	PPM
ISOBUTANOL	10.5	PPM
BENZENE	0.16	PPM
TOLUENE	12.48	PPM
XYLENE	25.1	PPM
METHANOL	2.78	PPM

California List

Yes _____ No _____

Please Check

Sent to G.C.

LOG IN _____

PERMIT # _____

HAZ CODES F007

[redacted]

OK ___ [redacted]

PRICE [redacted]

QUOTE [redacted]

WASTE SOURCE	SERVICE CHEMICAL
WASTE GENERATOR	
WASTE DESCRIPTION	CYANIDE PLATING [illegible]
RECEIPT DATE	VOLUME 5000 GAL / QTS

WASTE CHARACTERISTICS

COLOR/APPEARANCE	CLEAR YELLOW-GREEN	WATER MISCIBILITY	✓
% FLOATER	ND	% OIL ON ACIDIFICATION	ND
% FREE OIL	ND		

TEST	As Rec.	LEACH.	TEST	As Rec.	TCLP
PH	9.1		Ag, ppm	3.0	
% TOTAL SOLIDS	11.98		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	0.2	
% SUSPENDED SOLIDS	0.10		Cd, ppm	2.4	
% SETTLEABLE SOLIDS	ND		Cr, ppm	3.0	
FLASH POINT °C			Cr (Hex), ppm	—	
OIL AND GREASE ppm	ND		Cu, ppm	960	
PHENOLS ppm			Hg, ppb	<3	
CHLORIDE ppm			Ni, ppm	720	
BROMIDE, ppm			Pb, ppm	1.1	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.01	
COD ppm	19,876		Zn, ppm	0.8	
BOD, ppm			Fe, ppm	3.5	
ACIDITY mg/l as $CaCo_3$					
ALKALINITY mg/l as $CaCo_3$			Tl ppm		
CYANIDE, ppm (TOTAL)	525		NH_3	ND	
CYANIDE, ppm (RELEASE)					
SULFIDE, ppm (TOTAL)	<1		TOX, ppm		
SULFIDE, ppm			TOC, ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 10 ml w/ 6.5 ml NaOH

TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	55	70	IRON, ppm	5.7	2.3
% SOLIDS Produced by Weight			NICKEL, ppm	1.2	5.0
COD, ppm	23 578	28 833	ZINC, ppm	5.0	3.6
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.2	1.4
BORON ppm			LEAD, ppm	0.5	0.3
CADMIUM, ppm	<0.1	<0.1	MERCURY ppb	<3	<3
CHROMIUM (TOTAL), ppm	0.4	0.9	Tl, ppm		
CHROMIUM (HEX), ppm					

ACCEPTED _____ REJECTED: _____

COMMENTS OXIDIZE CYANIDE w/ H_2O_2

California List

Yes _____ No _____

Please Check

Sent for G C

LOG IN _____

PERMIT # _____

HAZ CODES F012

Peninsular Boil

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

OK ___ ACCEPT ___ REJECT

PRICE _____

QUOTE _____

WASTE SOURCE

WASTE GENERATOR: MIDWEST STEEL

WASTE DESCRIPTION: QUENCH WATER TREATMENT SLUDGE

RECEIPT DATE _____ VOLUME _____

WASTE CHARACTERISTICS

COLOR/APPEARANCE: CLOUDY GREY SLUDGE — WATER MISCIBILITY: +

% FLOATER: / — % OIL ON ACIDIFICATION: /

% FREE OIL: /

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
pH	8.7		Ag, ppm	0.15	
% TOTAL SOLIDS	10.25		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	<0.1	
% SUSPENDED SOLIDS	6.28		Cd, ppm	<0.1	
% SETTLEABLE SOLIDS			Cr, ppm	840.0	
FLASH POINT °C	>140 °F		Cr (Hex), ppm	490.0	
OIL AND GREASE ppm			Cu, ppm	0.7	
PHENOLS ppm	12.5		Hg, ppb	<3	
CHLORIDE ppm			Ni, ppm	0.75	
BROMIDE ppm			Pb, ppm	0.1	
PHOSPHATE ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	13,973		Zn, ppm	1.4	
BOD ppm			Fe ppm	560	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			Tl ppm		
CYANIDE ppm (TOTAL)	110		NH_3	ND	
CYANIDE ppm (RELEASE)					
SULFIDE ppm (TOTAL)	91		TOX, ppm		
SULFIDE ppm			TOC, ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10): 15.2 ml 0.1 N NaOH

TREATMENT WITH MIX TANK: (ml WASTE + ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	24	32	IRON, ppm	5.8	6.2
% SOLIDS Produced by Weight	0.28	0.45	NICKEL, ppm	5.2	3.8
COD ppm	12,945	10,365	ZINC, ppm	6.0	4.2
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	1.1	1.7
BORON ppm			LEAD, ppm	0.5	0.5
CADMIUM ppm	0.05	0.05	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	3.0	3.6	Tl ppm		
CHROMIUM (HEX) ppm					

ACCEPTED _____ REJECTED _____

COMMENTS _____

California Lis

Yes _____ No _____

Please Check

Sent for G C

APPENDIX C-1, DATA SHEET #23

CONVERSION COATING OF ALUMINIUM - F019

LOG IN _____

PERMIT # _____

HAZ CODES F019

Calumet

ENVIRONMENTAL SERVICES COMPANY
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

OK ___ ACCEPT ___ REJECT ___

PRICE: _____

QUOTE _____

WASTE SOURCE

WASTE GENERATOR: ALUMINUM COIL ANODIZING CORP

WASTE DESCRIPTION: WASTEWATER TREATMENT SLUDGE (CONVERSION COATING OF ALUMINUM

RECEIPT DATE: VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE: GREY SLUDGE

WATER MISCIBILITY: T

% FLOATER: —

% OIL ON ACIDIFICATION: —

% FREE OIL: —

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
PH	7.6		Ag, ppm	0.25	
% TOTAL SOLIDS	8.17		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	<0.1	
% SUSPENDED SOLIDS	5.84		Cd, ppm	0.95	
% SETTLEABLE SOLIDS			Cr, ppm	640.0	
FLASH POINT °C	>140°F		Cr (Hex), ppm	—	
OIL AND GREASE ppm	91		Cu, ppm	15.0	
PHENOLS ppm	ND		Hg, ppb	<3	
CHLORIDE ppm			Ni, ppm	480.0	
BROMIDE, ppm			Pb ppm	610.0	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	1319		Zn, ppm	6.0	
BOD ppm			Fe, ppm	440.0	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			Tl ppm		
CYANIDE ppm (TOTAL)	<1.0		NH_3		
CYANIDE, ppm (RELEASE)					
SULFIDE, ppm (TOTAL)	<1.0		TOX, ppm		
SULFIDE ppm			TOC, ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10): 4.5 mL 0.1 N NaOH

TREATMENT WITH MIX TANK: (10 ml WASTE + 40 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	38	62	IRON, ppm	5.7	3.5
% SOLIDS Produced by Weight	0.79	1.47	NICKEL, ppm	3.3	5.2
COD, ppm	11,729	7034	ZINC, ppm	2.45	1.83
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	2.7	0.5
BORON ppm			LEAD, ppm	<0.4	<0.4
CADMIUM ppm	1.22	0.83	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	1.4	1.44	Tl ppm		
CHROMIUM (HEX), ppm					

ACCEPTED: _____ REJECTED: _____

COMMENTS _____

California List

Yes ____ No ____

Please Check

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APPENDIX C-1, DATA SHEET #24

MULTI-SOURCE LEACHATE - F039

LOG IN _____

PERMIT # _____

HAZ CODES F039

Calumet

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

BIG ANALYSIS _____

OK___ ACCEPT___ REJECT___

PRICE _____

QUOTE _____

WASTE SOURCE

WASTE GENERATOR: CID LANDFILL

WASTE DESCRIPTION: LEACHATE

RECEIPT DATE: VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE: CLOUDY, DARK

WATER MISCIBILITY: +

% FLOATER: —

% OIL ON ACIDIFICATION: —

% FREE OIL: —

TEST	As Rec.	LEACH.	TEST	As Rec.	TCLP
pH	3.7		Ag. ppm	0.4	
% TOTAL SOLIDS	1.74		As. ppm	<0.1	
% DISSOLVED SOLIDS			Ba. ppm	<0.5	
% SUSPENDED SOLIDS	0.53		Cd. ppm	<0.2	
% SETTLEABLE SOLIDS			Cr. ppm	6.8	6.8
FLASH POINT °C	>140 °F		Cr (Hex). ppm	—	
OIL AND GREASE ppm	36.0		Cu. ppm	1.4	
PHENOLS ppm	<1.0		Hg. ppb	<3	
CHLORIDE ppm			Ni. ppm	1.2	
BROMIDE. ppm			Pb ppm	2.8	
PHOSPHATE ppm (TOTAL)			Se. ppm	<0.1	
COD ppm	5600		Zn. ppm	27.2	
BOD ppm			Fe ppm	48.0	
ACIDITY mg/l as $CaCo_3$					
ALKALINITY mg/l as $CaCo_3$			Tl ppm		
CYANIDE ppm (TOTAL)	1.2		NH_3	ND	
CYANIDE ppm (RELEASE)					
SULFIDE ppm (TOTAL)	24.0		TOX ppm		
SULFIDE ppm	<5.0		TOC. ppm	2996	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10): 6.3 mls. 0.1 N NaOH

TREATMENT WITH MIX TANK: (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	70	55	IRON. ppm	46.0	44.0
% SOLIDS Produced by Weight	0.25	0.27	NICKEL. ppm	6.0	5.1
COD ppm	12,000	12,000	ZINC. ppm	0.67	0.54
CYANIDE (TOTAL). ppm			O&G. ppm		
CYANIDE (RELEASABLE). ppm			COPPER. ppm	0.1	0.1
BORON ppm			LEAD. ppm	0.25	0.17
CADMIUM ppm	<0.1	<0.1	MERCURY. ppb		
CHROMIUM (TOTAL). ppm	3.5	3.0	___ ppm		
CHROMIUM (HEX) ppm					

ACCEPTED: REJECTED:

COMMENTS

California List

Yes _____ No _____

Please Check

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LOG IN _____

PERMIT # _____

HAZ CODES K002

Calmar Oil
ENVIRONMENTAL SERVICES COMPANIES
11[illegible] Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

OK ___ ACCEPT ___ REJECT ___

PRICE _____

QUOTE _____

WASTE SOURCE

WASTE GENERATOR DESOTO

WASTE DESCRIPTION CHROME YELLOW WASTE

RECEIPT DATE _____ VOLUME 60,000 /YR

WASTE CHARACTERISTICS

COLOR/APPEARANCE LT YELLOW. CLOUDY WATER MISCIBILITY +

% FLOATER — % OIL ON ACIDIFICATION —

% FREE OIL —

TEST	As Rec.	LEACH.	TEST	As Rec.	TCLP
PH	7.1		Ag, ppm	<0.1	
% TOTAL SOLIDS	1.64		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	<0.1	
% SUSPENDED SOLIDS	1.36		Cd, ppm	0.2	
% SETTLEABLE SOLIDS			Cr ppm	432	
FLASH POINT °C	>140°F		Cr (Hex), ppm	—	
OIL AND GREASE ppm			Cu, ppm	0.6	
PHENOLS ppm	1.5		Hg, ppb	<3	
CHLORIDE ppm			Ni, ppm	0.8	
CYANIDE, ppm			Pb ppm	2.1	
PHOSPHATE, ppm (TOTAL)			Se ppm	<0.1	
COD ppm	10,832		Zn, ppm	46	
[illegible] ppm			Fe, ppm	18	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			Tl ppm		
CYANIDE ppm (TOTAL)	<1.0		NH_3	ND	
CYANIDE, ppm (RELEASE)					
SULFIDE, ppm (TOTAL)	<1.0		TOX, ppm		
SULFIDE, ppm			TOC, ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 1.1 ml 0.1 N NaOH

TREATMENT WITH MIX TANK (10 ml WASTE + 40 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	38	25	IRON, ppm	7.8	6.2
% SOLIDS Produced by Weight			NICKEL, ppm	1.2	1.2
COD, ppm	25,559	20,695	ZINC, ppm	0.6	2.3
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.1	0.1
BORON ppm			LEAD, ppm	0.20	0.24
CADMIUM ppm	<0.1	<0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	0.4	0.4	Tl ppm		
CHROMIUM (HEX), ppm					

ACCEPTED _____ REJECTED: _____

COMMENTS _____

California List

Yes ___ No ___

Please Check

Sent for G.C

CleanHarbors

Form No LAS 7-F

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

C- # _____

PERMIT # _____ California List _____

HAZARD CODE K044, K046, D003

WASTE SOURCE
WASTE GENERATOR DEPT OF THE ARMY
WASTE DESCRIPTION WASTEWATER FROM EXPLOSIVES MFG.
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE CLOUDY LIQUID WATER MISCIBILITY +
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH
pH	6.5		Ag, ppm	<0.1	
% TOTAL SOLIDS	0.13		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	1.6	
% SUSPENDED SOLIDS	0.07		Cd, ppm	<0.1	
% SETTLEABLE SOLIDS			Cr, ppm	1.1	
FLASH POINT °F	>140		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	284		Cu, ppm	2.2	
PHENOLS, ppm	2.5		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	1.2	
BROMIDE, ppm			Pb, ppm	26.0	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	4400		Zn, ppm	2.8	
BOD, ppm			Fe, ppm	8.0	
ACIDITY mg/l as $CaCO_3$			Tl, ppm	<0.1	
ALKALINITY mg/l as $CaCO_3$			NH_3	ND	
CYANIDE, ppm (TOTAL)	3.75		TOX, ppm		
CYANIDE, ppm (RELEASE)			THOC, ppm		
SULFIDE, ppm (TOTAL)	<10.0		TOV, ppm		
SULFIDE, ppm (RELEASE)					

COMMENTS THIS REPORT HAS BEEN PREPARED FOR THE EXCLUSIVE USE AND BENEFIT OF CLEAN HARBORS NO REPRESENTATION CONCERNING SAMPLE VALIDITY OR ANALYTICAL COMPLETENESS IS HEREBY MADE TO ANY OTHER PERSON RECEIVING THIS REPORT.

LOG IN _____

PERMIT # _____

HAZ CODES 1048

Calumet

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

OK ___ ACCEPT ___ REJECT ___

PRICE _____

QUOTE _____

WASTE SOURCE

WASTE GENERATOR MOBIL OIL

WASTE DESCRIPTION DISSOLVED AIR FLOATATION FLOAT SLUDGE

RECEIPT DATE VOLUME 500 000 /YR

WASTE CHARACTERISTICS

COLOR/APPEARANCE BLACK, CLOUDY, OIL SMELL WATER MISCIBILITY +

% FLOATER 1 % OIL ON ACIDIFICATION 1

% FREE OIL 1

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
PH	7.2		Ag, ppm	0.5	
% TOTAL SOLIDS	28.75		As, ppm	0.04	
% DISSOLVED SOLIDS			Ba, ppm	2.0	
% SUSPENDED SOLIDS	7.46		Cd, ppm	2.5	0.7
% SETTLEABLE SOLIDS			Cr, ppm	480.0	3.1
FLASH POINT °C	>140 °F		Cr (Hex), ppm	—	
OIL AND GREASE ppm	74,182		Cu, ppm	24.0	
PHENOLS ppm			Hg, ppb	<3	
CHLORIDE ppm			Ni, ppm	46.0	
BROMIDE, ppm			Pb, ppm	160.0	0.9
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	116,562		Zn, ppm	460	
BOD ppm			Fe, ppm	2080	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			Tl ppm		
CYANIDE ppm (TOTAL)			NH_3	ND	
CYANIDE ppm (RELEASE)					
SULFIDE ppm (TOTAL)	2076.0		TOX, ppm		
SULFIDE ppm	452.0		TOC, ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 3.0 L 0.1 N NaOH

TREATMENT WITH MIX TANK (ml WASTE + ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	20	24	IRON, ppm	12.0	6.0
% SOLIDS Produced by Weight	0.25	7.67	NICKEL, ppm	4.5	3.3
COD, ppm	16,300	16,085	ZINC, ppm	7.5	2.3
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	1.4	0.2
BORON ppm			LEAD, ppm	0.4	0.4
CADMIUM ppm	0.15	<0.1	MERCURY ppb		
CHROMIUM (TOTAL), ppm	8.0	4.2	Tl ppm		
CHROMIUM (HEX) ppm					

ACCEPTED REJECTED:

COMMENTS

California List

Yes ___ No ___

Please Check

Sent to G C

TR # 7621
LOG N 42590
PERMIT # 0000016
HAZ CODES K062

CleanHarbors
ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS 4-17-90
OK ___ ACCEPT ✓ REJECT
PRICE ___
QUOTE ___

WASTE SOURCE Mr. F.
WASTE GENERATOR General Tube
WASTE DESCRIPTION Pickle Liquor
RECEIPT DATE
VOLUME 150,000 gal qty

WASTE CHARACTERISTICS

COLOR/APPEARANCE Yellow
WATER MISCIBILITY +
% FLOATER —
% OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH.	TEST	As Rec.	Lime Neut. TCLP
PH	1.2		Ag, ppm	0.84	
% TOTAL SOLIDS	355		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	0.22	
% SUSPENDED SOLIDS	0.23		Cd, ppm	0.4	0.1
% SETTLEABLE SOLIDS			Cr, ppm	49.6	2.1
FLASH POINT °C	>200°F		Cr (Hex), ppm	ND	
OIL AND GREASE, ppm	<1.0		Cu, ppm	1.6	
PHENOLS, ppm	1.0		Hg, ppb	<3.0	
CHLORIDE, ppm			Ni, ppm	29.2	
BROMIDE, ppm			Pb, ppm	3.8	0.9
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	22,400		Zn, ppm	800	
BOD ppm			Fe, ppm	71,600	
ACIDITY mg/l as $CaCO_3$	8.0				
ALKALINITY mg/l as $CaCO_3$			Tl, ppm	24	
CYANIDE ppm (TOTAL)	<1.0		NH_3	ND	
CYANIDE ppm (RELEASE)	<1.0				
SULFIDE ppm (TOTAL)	<1.0		TOX, ppm		
SULFIDE ppm			TOC, ppm	87.0	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 366.0 mls 0.1 N NaOH: 10 mls Sample
TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	65	90	IRON, ppm	7.8	7.8
% SOLIDS Produced by Weight	3.9	5.5	NICKEL, ppm	2.8	2.4
COD, ppm	24,000	16,800	ZINC, ppm	0.2	0.1
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.8	0.6
BORON, ppm			LEAD, ppm	0.3	0.3
CADMIUM ppm	0.1	0.1	MERCURY, ppb	23.0	<3.0
CHROMIUM (TOTAL), ppm	0.3	0.1	Tl, ppm		
CHROMIUM (HEX), ppm					

ACCEPTED: Catherine M. Letson Lab Supervisor REJECTED
COMMENTS Lime neutralize prior to treatment.

California Li
Yes ✓ No
Ph Please Chec
Sent for G.C

APPENDIX C-1, DATA SHEET #29

COKING - K060/K087

LOG IN _____

PERMIT # _____

HAZ CODES K060

Chemical Waste

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS _____

OK ___ ACCEPT ___ REJECT ___

PRICE _____

QUOTE _____

WASTE SOURCE

WASTE GENERATOR U.S. STEEL

WASTE DESCRIPTION AMMONIA STILL LIME SLUDGE

RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE GRAY-BLUE SLURRY WATER MISCIBILITY —

% FLOATER — % OIL ON ACIDIFICATION —

% FREE OIL —

TEST	As Rec.	LEACH TEST	As Rec.	TCLP
PH	12.0	Ag ppm	0.5	
% TOTAL SOLIDS	18.21	As ppm	0.2	
% DISSOLVED SOLIDS		Ba. ppm	2.5	
% SUSPENDED SOLIDS	8.98	Cd. ppm	3.0	
% SETTLEABLE SOLIDS		Cr ppm	240.0	
FLASH POINT °C	>140	Cr (Hex) ppm	—	
OIL AND GREASE ppm	478	Cu. ppm	14.0	
PHENOLS ppm	418	Hg. ppb	<3	
CHLORIDE ppm		Ni ppm	200.0	
BROMIDE. ppm		Pb ppm	5.48	
PHOSPHATE ppm (TOTAL)		Se ppm	<0.1	
COD ppm	40,800	Zn ppm	160.0	
BOD ppm		Fe ppm	9200	
ACIDITY mg/l as $CaCO_3$				
ALKALINITY mg/l as $CaCO_3$		[illegible] ppm		
CYANIDE ppm (TOTAL)	52.0	[illegible]	18,400	
CYANIDE, ppm (RELEASE)				
SULFIDE ppm (TOTAL)	112.0	TOX ppm		
SULFIDE ppm		TOC ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 48 mL 0.1 N H_2SO_4

TREATMENT WITH MIX TANK 10 ml WASTE + 90 ml MIX TANK

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	52	80	IRON. ppm	24.0	20.0
% SOLIDS Produced by Weight	1.31	2.44	NICKEL. ppm	2.2	3.0
COD ppm	13,000	17,200	ZINC. ppm	0.62	0.38
CYANIDE (TOTAL). ppm			O&G. ppm		
CYANIDE (RELEASABLE). ppm			COPPER ppm	0.1	0.1
BORON ppm			LEAD. ppm	0.31	0.38
CADMIUM ppm	<0.1	0.1	MERCURY ppb		
CHROMIUM (TOTAL) ppm	0.1	0.3	[illegible] ppm		
CHROMIUM (HEX) ppm					

ACCEPTED REJECTED

COMMENTS

California List

Yes ___ No ___

Please Check

Sent to G.D.

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1800 S. Stony Island Avenue
Chicago, Illinois 60617
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LAB ANALYSIS _____
OK ___ ACCEPT ___ REJECT ___
PRICE _____
QUOTE _____

CODES K100

WASTE SOURCE
WASTE GENERATOR ACME STEEL
WASTE DESCRIPTION LEACH SOLUTION (SECONDARY LEAD)
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE YELLOW-GREEN, HEXCHROME WATER MISCIBILITY —
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec	LEACH	TEST	As Rec.	EPT
pH	1.2		Ag, ppm	0.2	
% TOTAL SOLIDS	12.34		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	<0.1	
% SUSPENDED SOLIDS	0.27		Cd, ppm	210	
% SETTLEABLE SOLIDS			Cr, ppm	6190	
FLASH POINT °C	>140		Cr (Hex), ppm	4200	
OIL AND GREASE, ppm	410		Cu, ppm	220	
PHENOLS, ppm	<0.1		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	44.0	
BROMIDE, ppm			Pb, ppm	12,244	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	6400		Zn, ppm	68.0	
TOC, ppm			Fe, ppm	1240	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			T, ppm	<0.1	
CYANIDE, ppm (TOTAL)	<1.0		NH	ND	
CYANIDE, ppm (RELEASE)					
SULFIDE, ppm (TOTAL)	<10.0		TOX, ppm		
SULFIDE, ppm			TOC, ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 482 mls 0.1 N $NaOH$
TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + PRETREATED Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	52	80	IRON, ppm	19.0	24.0
% SOLIDS Produced by Weight	2.04	2.39	NICKEL, ppm	0.5	0.8
COD, ppm			ZINC, ppm	0.45	0.40
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.3	0.6
BORON, ppm			LEAD, ppm	0.27	0.22
CADMIUM, ppm	0.1	0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	0.2	0.2	T, ppm		
CHROMIUM (HEX), ppm					

ACCEPTED REJECTED:

COMMENTS PRETREAT HEXAVALENT CHROMIUM

California List
Yes _____ No _____
Please Check

Sent for G.C.

LOG IN _____

PERMIT # _____

HAZ CODES K086

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

OK ACCEPT REJECT

PRICE _____

QUOTE _____

WASTE SOURCE

WASTE GENERATOR INMONT

WASTE DESCRIPTION INK TANK RINSE AND WASTE

RECEIPT DATE VOLUME 60,000 GALS/YR.

WASTE CHARACTERISTICS

COLOR/APPEARANCE THICK, DARK PURPLE WATER MISCIBILITY +

% FLOATER — % OIL ON ACIDIFICATION —

% FREE OIL —

TEST	As Rec.	LEACH.	TEST	As Rec.	TCLP
PH	8.9		Ag, ppm	<0.1	
% TOTAL SOLIDS	2.81		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	0.25	
% SUSPENDED SOLIDS	0.57		Cd, ppm	<0.1	
% SETTLEABLE SOLIDS	<1%		Cr, ppm	390.0	
FLASH POINT °C	>140°F		Cr (Hex), ppm	—	
OIL AND GREASE ppm			Cu, ppm	10.0	
PHENOLS ppm	1.0		Hg, ppb	<3	
CHLORIDE ppm			Ni, ppm	3.4	
BROMIDE, ppm			Pb ppm	75.0	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	75,219		Zn, ppm	8.0	
BOD ppm			Fe, ppm	180.0	
ACIDITY mg/l as $CaCo_3$					
ALKALINITY mg/l as $CaCo_3$			Tl ppm		
CYANIDE ppm (TOTAL)	ND		NH_3		
CYANIDE ppm (RELEASE)					
SULFIDE ppm (TOTAL)	ND		TOX, ppm	—	—
SULFIDE ppm			TOC, ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 13 mls. 0.1 N NaOH

TREATMENT WITH MIX TANK (10 ml WASTE + 40 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	40	60	IRON, ppm	18	12
% SOLIDS Produced by Weight	0.20	0.38	NICKEL, ppm	4.3	3.5
COD, ppm	50,000	48,000	ZINC, ppm	1.40	1.33
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.1	0.3
BORON ppm			LEAD, ppm	0.26	0.30
CADMIUM ppm	0.1	0.1	MERCURY ppb		
CHROMIUM (TOTAL), ppm	0.8	0.7	Tl ppm		
CHROMIUM (HEX) ppm					

ACCEPTED REJECTED

COMMENTS

California List

Yes _____ No _____

Please Check

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Form No. LAS 7

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

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HAZARD CODE D002

WASTE SOURCE
WASTE GENERATOR RAY MAC INC
WASTE DESCRIPTION BOTTOM SLUDGE
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE DARK SLURRY WATER MISCIBILITY +
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH
pH	13.0		Ag, ppm	<0.1	
% TOTAL SOLIDS	18.4		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	<0.1	
% SUSPENDED SOLIDS	9.96		Cd, ppm	0.2	
% SETTLEABLE SOLIDS			Cr, ppm	1.0	
FLASH POINT °F	>140		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	685		Cu, ppm	450	
PHENOLS, ppm	<1.0		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	0.6	
BROMIDE, ppm			Pb, ppm	1.01	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	18400		Zn, ppm	1.4	
BOD, ppm			Fe, ppm	10.0	
ACIDITY mg/l as $CaCO_3$			Tl, ppm	<0.1	
ALKALINITY mg/l as $CaCO_3$			NH_3	ND	
CYANIDE, ppm (TOTAL)	<1.0		TOX, ppm		
CYANIDE, ppm (RELEASE)			HOC, ppm		
SULFIDE, ppm (TOTAL)	<1.0		TOV, ppm		
SULFIDE, ppm (RELEASE)					

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Form No LAS 7/8

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Chicago, Illinois 60617
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PERMIT = _____ California List _____

HAZARD CODE D003 _____

WASTE SOURCE
WASTE GENERATOR CHEM - TECH
WASTE DESCRIPTION SCRUBBER BOTTOMS
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR APPEARANCE BLACK SOLIDS WATER MISCIBILITY +
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH.
pH	13.8 (10% Sol.)		Ag, ppm	0.6	
% TOTAL SOLIDS	87.8		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	2.6	
% SUSPENDED SOLIDS	67.0		Cd, ppm	0.4	
% SETTLEABLE SOLIDS			Cr, ppm	320	1.2
FLASH POINT °F	>140		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	172		Cu, ppm	2520	
PHENOLS, ppm	<1.0		Hg, ppb	7.6	
CHLORIDE, ppm			Ni, ppm	7.2	
BROMIDE, ppm			Pb, ppm	4.4	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	—		Zn, ppm	3200	
BOD, ppm			Fe, ppm	1200	
ACIDITY mg/l as $CaCO_3$			Tl, ppm	32	
ALKALINITY mg/l as $CaCO_3$	19.19		NH_3	NO	
CYANIDE, ppm (TOTAL)	<1.0		TOX, ppm		
CYANIDE, ppm (RELEASE)			HOC, ppm		
SULFIDE, ppm (TOTAL)			TOC, ppm	4014	
SULFIDE, ppm (RELEASE)	48,000				

COMMENTS THIS REPORT HAS BEEN PREPARED FOR THE EXCLUSIVE USE AND BENEFIT OF CLEAN HARBORS NO REPRESENTATION CONCERNING SAMPLE VALIDITY OR ANALYTICAL COMPLETENESS IS HEREBY MADE TO ANY OTHER PERSON RECEIVING THIS REPORT.

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Form No LAS 7

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List: _____

HAZARD CODE F006, D007

WASTE SOURCE
WASTE GENERATOR CATERPILLAR
WASTE DESCRIPTION CHROME PLATING SLUDGE
RECEIPT DATE VOLUME 50 DRS./MO.

WASTE CHARACTERISTICS

COLOR/APPEARANCE BROWN SOLID WATER MISCIBILITY +
% FLOATER – % OIL ON ACIDIFICATION –
% FREE OIL –

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH
pH	8.2		Ag, ppm	1.8	
% TOTAL SOLIDS	87		As, ppm	1.2	0.53
% DISSOLVED SOLIDS			Ba, ppm	2200	0.33
% SUSPENDED SOLIDS			Cd, ppm	1.3	0.02
% SETTLEABLE SOLIDS			Cr, ppm	89 000	910
FLASH POINT °F	>210		Cr (Hex), ppm	—	
OIL AND GREASE, ppm			Cu, ppm		
PHENOLS, ppm			Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm		
BROMIDE, ppm			Pb, ppm	100 000	1.4
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.2	
COD, ppm			Zn, ppm		
BOD, ppm			Fe, ppm		
ACIDITY mg/l as $CaCO_3$	2400		Tl, ppm		
ALKALINITY mg/l as $CaCO_3$			NH_3		
CYANIDE, ppm (TOTAL)	<1.0		TOX, ppm		
CYANIDE, ppm (RELEASE)			THOC, ppm		
SULFIDE, ppm (TOTAL)	<20		TOV, ppm		
SULFIDE, ppm (RELEASE)			S.G. G/ML	3.36	

COMMENTS THIS REPORT HAS BEEN PREPARED FOR THE EXCLUSIVE USE AND BENEFIT OF CLEAN HARBORS NO REPRESENTATION CONCERNING SAMPLE VALIDITY OR ANALYTICAL COMPLETENESS IS HEREBY MADE TO ANY OTHER PERSON RECEIVING THIS REPORT

As of the date of submittal of this Application, CHCI has not developed comprehensive anaytical data for pesticide-bearing wastes intended for the listed waste treatment process. Such analyses shall be submitted to IEPA as soon as they become available.

APPENDIX C-1, DATA SHEET #38

IGNITIBLE - D001

APPENDIX C-1, DATA SHEET #42

PESTICIDES/HERBICIDES - D012 - D017

CleanHarbors

Form No LAS 7/89

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # S. + T.

HAZARD CODE D029

California List _____

WASTE SOURCE
WASTE GENERATOR UNOCAL
WASTE DESCRIPTION WATER BASED POLYMER SLUDGE
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE WHITE SEMI-SOLID
WATER MISCIBILITY +
% FLOATER SOLIDS
% OIL ON ACIDIFICATION –
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH.
pH	9.8		Ag, ppm	0.2	
% TOTAL SOLIDS	50.0		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	<0.2	
% SUSPENDED SOLIDS	46.0		Cd, ppm	<0.2	
% SETTLEABLE SOLIDS			Cr, ppm	2.2	
FLASH POINT °F	>140		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	300		Cu, ppm	0.4	
PHENOLS, ppm	<0.5		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	3.2	
BROMIDE, ppm			Pb, ppm	2.6	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	30,000		Zn, ppm	0.82	
BOD, ppm			Fe, ppm	3.2	
ACIDITY mg/l as $CaCo_3$			Tl, ppm	0.3	
ALKALINITY mg/l as $CaCo_3$			NH_3	—	
CYANIDE ppm (TOTAL)	<1.0		TOX, ppm		
CYANIDE, ppm (RELEASE)			HOC, ppm		
SULFIDE, ppm (TOTAL)	<1.0		TOC, ppm	6135	
SULFIDE, ppm (RELEASE)			1,1 DICHLOROETHYLENE, ppm	2.7	2.7

COMMENTS THIS REPORT HAS BEEN PREPARED FOR THE EXCLUSIVE USE AND BENEFIT OF CLEAN HARBORS NO REPRESENTATION CONCERNING SAMPLE VALIDITY OR ANALYTICAL COMPLETENESS IS HEREBY MADE TO ANY OTHER PERSON RECEIVING THIS REPORT.

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Form No. LAS 7 89

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11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List _____

HAZARD CODE K062

WASTE SOURCE _____
WASTE GENERATOR REPUBLIC STEEL
WASTE DESCRIPTION PICKLE LIQUOR SOLIDS
RECEIPT DATE _____ VOLUME _____

WASTE CHARACTERISTICS

COLOR/APPEARANCE GREEN CRYSTAL CHUNKS WATER MISCIBILITY _____
% FLOATER _____ % OIL ON ACIDIFICATION _____
FREE OIL _____

TEST	As Rec.	LEACH.	TEST	As Rec.	LEACH.
pH			Ag, ppm	4.5	
% TOTAL SOLIDS	98P		As, ppm	0.5	
% DISSOLVED SOLIDS			Ba, ppm	5.2	
% SUSPENDED SOLIDS			Cd, ppm	0.2	
% SETTLEABLE SOLIDS			Cr, ppm	2500	
FLASH POINT °F	>140		Cr (Hex), ppm	2.4	
OIL AND GREASE, ppm			Cu, ppm	52.0	
PHENOLS, ppm	<10.0		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	98.0	
BROMIDE, ppm			Pb, ppm	0.8	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm			Zn, ppm	4380	
BOD, ppm			Fe, ppm	146,000	
ACIDITY mg/1 as $CaCo_3$			Tl, ppm	<1.0	
ALKALINITY, mg/1 as $CaCo_3$			NH_3	ND	
CYANIDE, ppm (TOTAL)	<1.0		TOX, ppm		
CYANIDE, ppm (RELEASE)			HOC, ppm		
SULFIDE, ppm (TOTAL)	<1.0		TOV, ppm		
SULFIDE, ppm (RELEASE)			S.G.	1.5	

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Form No. LAS 7/89

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List _____

HAZARD CODE NON HAZ

WASTE SOURCE
WASTE GENERATOR VISKASE CORP
WASTE DESCRIPTION SOLIDIFIED VISCOSE
RECEIPT DATE _____ VOLUME _____

WASTE CHARACTERISTICS

COLOR/APPEARANCE GRAYISH SOLID WATER MISCIBILITY —
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH.	TEST	As Rec.	LEACH.
pH	11.0 (10% sol.)		Ag, ppm	<0.1	
% TOTAL SOLIDS	61.3		As, ppm	0.1	
% DISSOLVED SOLIDS			Ba, ppm	21.0	
% SUSPENDED SOLIDS			Cd, ppm	<0.1	
% SETTLEABLE SOLIDS			Cr, ppm	6.5	<0.1
FLASH POINT °F	> 212		Cr (Hex), ppm	—	
OIL AND GREASE, ppm			Cu, ppm	79.0	
PHENOLS, ppm	<10.0		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	3.5	
BROMIDE, ppm			Pb, ppm	289.0	<0.1
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm			Zn, ppm	76.0	
BOD, ppm			Fe, ppm	122.0	
ACIDITY mg/1 as $CaCo_3$			Tl, ppm	<0.1	
ALKALINITY, mg/1 as $CaCo_3$	16.4		NH_4	ND	
CYANIDE, ppm (TOTAL)	<10.0		TOX, ppm		
CYANIDE, ppm (RELEASE)			HOC, ppm		
SULFIDE, ppm (TOTAL)	<20		TOV, ppm		
SULFIDE, ppm (RELEASE)			D018 - D043		SEE ATTACH

COMMENTS THIS REPORT HAS BEEN PREPARED FOR THE EXCLUSIVE USE AND BENEFIT OF CLEAN HARBORS NO REPRESENTATION CONCERNING SAMPLE VALIDITY OR ANALYTICAL COMPLETENESS IS HEREBY MADE TO ANY OTHER PERSON RECEIVING THIS REPORT.

MONITORING AND TECHNOLOGIES, INC.

8100 North Austin Avenue
Morton Grove, Illinois 60053-3203
708/967-6666
FAX: 708/967-6735

To: D. Kuzemka
As per our phone Cal
today. E. Marsh

LABORATORY REPORT

99304-A

Viskase Corporation
6855 W. 65th Street
Bedford Park, IL 60638

Report Date: August 15, 1990
Sample Received: 6/29/90

Sample Description: Waste Room #150-01
Sample No. 2533

Compounds	Concentration Found IN Sample	Concentration Found IN Blank	Method Detection Limit (MDL)	Limit TCLP mg/l
1. Benzene	<0.5	<0.001	0.0001	0.5
2. Carbon Tetrachloride	<0.5	<0.001	0.001	0.5
3. Chlorobenzene	<100.00	<0.001	0.001	100
4. Chloroform	<6.00	<0.001	0.001	6
5. o-Cresol	<200.00	<0.001	0.001	200
6. m-Cresol	<200.00	<0.001	0.001	200
7. p-Cresol	<200.00	<0.001	0.001	200
Total Cresol	<200.00	<0.001	0.001	200
8. 1,4-Dichlorobenzene	<7.5	<0.001	0.001	7.5
9. 1,2-Dichloroethane	<0.500	<0.001	0.001	0.5
10. 1,1-Dichloroethene	<0.700	<0.001	0.001	0.7
11. 2,4-Dinitrotoluene	<0.130	<0.005	0.001	0.13
12. Hexachlorobenzene	<0.130	<0.001	0.001	0.13
13. Hexachloro-1,3-butadiene	<0.50	<0.001	0.001	0.5
14. Hexachloroethane	<3.0	<0.001	0.001	3.0
15. Methyl ethyl Ketone	<200.00	<0.005	0.005	200
16. Nitrobenzene	<2.0	<0.001	0.001	2.0
17. Pentachlorophenol	<100.00	<0.001	0.001	100
18. Pyridine	<5.0	<0.001	0.001	5
19. Tetrachloroethylene	<0.7	<0.001	0.001	0.7
20. Trichloroethylene	<0.5	<0.001	0.001	0.5
21. 2,4,5-Trichlorophenol	<400.00	<0.001	0.001	400
22. 2,4,6-Trichlorophenol	<2.0	<0.001	0.001	2.0
23. Vinyl Chloride	<0.2	<0.001	0.001	0.2

All results expressed as ppm unless otherwise indicated.
Methods performed according to SW-846, "Test Methods for Evaluating Solid Was
Analysis performed on extract from TCLP.

Lee E. Zeller

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # ____

PERMIT # ____ California List ____

HAZARD CODE D043
S.+T.

WASTE SOURCE
WASTE GENERATOR SHERWIN WILLIAMS
WASTE DESCRIPTION LATEX PAINT SOLIDS
RECEIPT DATE ____ VOLUME ____

WASTE CHARACTERISTICS

COLOR/APPEARANCE WHITE, CLUMPY SOLIDS WATER MISCIBILITY —
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH.	TEST	As Rec.	LEACH.
pH	8.2 (10% SOL.)		Ag, ppm	<0.1	
% TOTAL SOLIDS	56.1		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	15.6	
% SUSPENDED SOLIDS			Cd, ppm	0.4	
% SETTLEABLE SOLIDS			Cr, ppm	1.2	
FLASH POINT °F	>140		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	2338		Cu, ppm	1.7	
PHENOLS, ppm	<10.0		Hg, ppb	4.3	
CHLORIDE, ppm			Ni, ppm	0.2	
BROMIDE, ppm			Pb, ppm	0.2	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	—		Zn, ppm	4.1	
BOD, ppm			Fe, ppm	15.6	
ACIDITY mg/l as $CaCo_3$			Tl, ppm	<0.1	
ALKALINITY, mg/l as $CaCo_3$			NH_3	ND	
CYANIDE, ppm (TOTAL)	<1.0		TOX, ppm		
CYANIDE, ppm (RELEASE)			HOC, ppm		
SULFIDE, ppm (TOTAL)	<10.0		TOV, ppm		
SULFIDE, ppm (RELEASE)			VINYL CHLORIDE		123.2

COMMENTS THIS REPORT HAS BEEN PREPARED FOR THE EXCLUSIVE USE AND BENEFIT OF CLEAN HARBORS NO REPRESENTATION CONCERNING SAMPLE VALIDITY OR ANALYTICAL COMPLETENESS IS HEREBY MADE TO ANY OTHER PERSON RECEIVING THIS REPORT

CleanHarbors

Form No LAS

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List _____

HAZARD CODE F002

WASTE SOURCE
WASTE GENERATOR COMM ED
WASTE DESCRIPTION 1,1,1 - TRICHLOROETHANE + OIL MIXTURE
RECEIPT DATE VOLUME 10 DR. / 2 TR.

WASTE CHARACTERISTICS

COLOR/APPEARANCE THIN OIL WATER MISCIBILITY —
% FLOATER — % OIL ON ACIDIFICATION
% FREE OIL 98

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH
pH	—		Ag, ppm	<2.0	
% TOTAL SOLIDS			As, ppm		
% DISSOLVED SOLIDS			Ba, ppm	<2.0	
% SUSPENDED SOLIDS			Cd, ppm	<2.0	
% SETTLEABLE SOLIDS			Cr, ppm	<2.0	
FLASH POINT °F	>140		Cr (Hex), ppm	—	
OIL AND GREASE, ppm			Cu, ppm	<2.0	
PHENOLS, ppm			Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	22.0	
BROMIDE, ppm			Pb, ppm	<2.0	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<2.0	
COD, ppm	—		Zn, ppm	2.2	
BOD, ppm			Fe, ppm	148	
ACIDITY mg/l as $CaCo_3$			Tl, ppm		
ALKALINITY mg/l as $CaCo_3$			NH_3		
CYANIDE, ppm (TOTAL)	<1.0		TOX, ppm	1232	
CYANIDE, ppm (RELEASE)			HOC, ppm		
SULFIDE, ppm (TOTAL)	<1.0		TOV, ppm		
SULFIDE, ppm (RELEASE)			1,1,1 - TRICHLOROETHANE	564	

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ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List _____

HAZARD CODE F006

WASTE SOURCE
WASTE GENERATOR ENGIS
WASTE DESCRIPTION NICKEL PLATING SLUDGE
RECEIPT DATE VOLUME 20 DR/QTR.

WASTE CHARACTERISTICS

COLOR/APPEARANCE DARK SOLID
% FLOATER –
% FREE OIL –
WATER MISCIBILITY +
% OIL ON ACIDIFICATION –

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH
pH	8.4 (10% SL)		Ag, ppm	0.26	
% TOTAL SOLIDS	30.25		As, ppm	0.23	
% DISSOLVED SOLIDS			Ba, ppm	0.60	
% SUSPENDED SOLIDS	25.67		Cd, ppm	0.62	
% SETTLEABLE SOLIDS			Cr, ppm	1.04	
FLASH POINT °F	>140		Cr (Hex), ppm	—	
OIL AND GREASE, ppm			Cu, ppm	1.18	
PHENOLS, ppm	35		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	23,200	
BROMIDE, ppm			Pb, ppm	0.78	
PHOSPHATE, ppm (TOTAL)			Se, ppm	0.72	
COD, ppm	80,000		Zn, ppm	12.8	
BOD, ppm			Fe, ppm	408	
ACIDITY mg/l as $CaCO_3$			Tl, ppm	0.84	
ALKALINITY mg/l as $CaCO_3$			NH_3	ND	
CYANIDE ppm (TOTAL)	<1.0		TOX ppm		
CYANIDE, ppm (RELEASE)			HOC ppm		
SULFIDE ppm (TOTAL)	<1.0		TOV ppm		
SULFIDE, ppm (RELEASE)					

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11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List _____

HAZARD CODE F012

WASTE SOURCE
WASTE GENERATOR J.K. WILLIAMS
WASTE DESCRIPTION FILTER PRESS CAKE (METAL HEAT TREATING QUENCH WATER)
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE GREY SOLID WATER MISCIBILITY +
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH
pH	8.4	(10% SOL.)	Ag, ppm	7.0	
% TOTAL SOLIDS	100		As, ppm	0.10	
% DISSOLVED SOLIDS			Ba, ppm	218.0	
% SUSPENDED SOLIDS	100		Cd, ppm	239	
% SETTLEABLE SOLIDS			Cr, ppm	21,400	
FLASH POINT °F	>140		Cr (Hex) ppm	—	
OIL AND GREASE, ppm			Cu, ppm	12,200	
PHENOLS, ppm	4.5		Hg, ppb	152	
CHLORIDE, ppm			Ni, ppm	16,280	
BROMIDE, ppm			Pb, ppm	5920	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	SOLID		Zn, ppm	14,560	
BOD ppm			Fe, ppm	22,720	
ACIDITY mg/l as $CaCO_3$			Tl, ppm	6.9	
ALKALINITY mg/l as $CaCO_3$			NH_3	ND	
CYANIDE, ppm (TOTAL)	482		TOX, ppm		
CYANIDE, ppm (RELEASE)			HOC, ppm		
SULFIDE, ppm (TOTAL)	<10.0		TOV ppm		
SULFIDE, ppm (RELEASE)					

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ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List _____

HAZARD CODE D007 (F019)

WASTE SOURCE
WASTE GENERATOR PRE-COAT METALS
WASTE DESCRIPTION CHEMICAL CONVERSION COATING OF ALUMINUM
RECEIPT DATE VOLUME 8-30 DR./QTR.

WASTE CHARACTERISTICS

COLOR/APPEARANCE ARMY GREEN - THIN WATER MISCIBILITY +
% FLOATER <1 % OIL ON ACIDIFICATION <1
% FREE OIL <1

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH
pH	8.2		Ag, ppm	0.12	
% TOTAL SOLIDS	2.46		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	12.2	
% SUSPENDED SOLIDS	1.07		Cd, ppm	0.20	
% SETTLEABLE SOLIDS			Cr, ppm	1456	
FLASH POINT °F	>140		Cr (Hex), ppm	1150	
OIL AND GREASE, ppm	<1.0		Cu, ppm	1.24	
PHENOLS, ppm	4.0		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	6.0	
BROMIDE, ppm			Pb, ppm	3.76	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	23,200		Zn, ppm	640	
BOD, ppm			Fe, ppm	99.6	
ACIDITY mg/l as $CaCo_3$			Tl, ppm	<0.8	
ALKALINITY mg/l as $CaCo_3$			NH_3	46.0	
CYANIDE, ppm (TOTAL)	<1.0		TOX, ppm		
CYANIDE, ppm (RELEASE)			HOC, ppm		
SULFIDE, ppm (TOTAL)	<10.0		TOV, ppm		
SULFIDE, ppm (RELEASE)					

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Resale Products

Product Bulletin

NALKIL® 2723

LIQUID WEED KILLER

Product Benefits

NALKIL 2723 is the easily dilutable formulating concentrate for NALKIL 2701. The dilute product is a fully solubilized bromacil formulation designed to provide fast, dramatic topkill, broad spectrum systemic action, and powerful, long-lasting residual control. NALKIL 2723 contains ENDRIFT®, Nalco's exclusive antimist agent that helps insure more efficient coverage.

EPA Reg. No. 1706-154
EPA Est. 1706-IL-1

Principal Uses

NALKIL 2723 is a concentrated herbicide for formulating use only. When diluted, the product is a highly effective, persistent, nonselective, general herbicide for extended control of a wide range of undesirable weeds and grasses. It is recommended for noncropland areas such as railroad rights-of-way, yards, and shops; industrial sites; around tanks and other storage facilities; under and around bridges; along fences or pipelines; wherever grasses and weeds might interfere with drainage, create a fire or other hazard, or provide an unsightly appearance. It is approved for use under EPA Registration Number 1706-154 and EPA Est. 1706-IL-1.

General Description

Form	Liquid
Color	Amber
Odor	Hydrocarbon
Flash Point (TOC)	126°F

Active Ingredients:	
Petroleum oil	67.03%
2, 4-Dichlorophenoxyacetic acid, isooctyl ester*	8.65%
Bromacil (5-bromo-3-sec-butyl-6-methyluracil)	4.79%
Pentachlorophenol	6.18%
Other Chlorophenols	0.72%
Inert Ingredients:	12.63%
Total	100.00%

*2, 4-Dichlorophenoxyacetic acid equivalent: 5.74%

Dosage

This product is for formulation use only.

It is a violation of federal law to use this product in a manner inconsistent with these directions.

To dilute for end use, add 5 gallons of NALKIL 2723 with ENDRIFT to 38.5 gallons of phytotoxic oil vehicle, and mix thoroughly.

Storage

Do not store near food, feed, fertilizers, seeds, insecticides, or fungicides.

(Continued on Reverse Side)

NALCO CHEMICAL COMPANY
SPECIALTY CHEMICALS
2901 BUTTERFIELD ROAD □ OAK BROOK, ILLINOIS 60521

SUBSIDIARIES IN ARGENTINA, AUSTRIA, BRAZIL, CHILE, COLOMBIA, ECUADOR, FINLAND, FRANCE, HOLLAND, HONG KONG, ITALY, PHILIPPINES, SAUDI ARABIA, SPAIN, SWEDEN, VENEZUELA AND WEST GERMANY • AFFILIATES IN AUSTRALIA, CANADA, JAPAN, MEXICO, SINGAPORE, SOUTH AFRICA, TAIWAN, UNITED KINGDOM, AND THE UNITED STATES

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-84 09:43

..TER F - FOR FORMULA NUMBER RETRIEVAL
P - FOR PRODUCT-NAME RETRIEVAL
"RETURN" - TO EXIT FROM PROGRAM ENTER PRODUCT-NAME 2723
'ENT PLT 1 PRIMARY MANUFACTURING FORMULA IS F# F6869

'RODUCT IS 2723 PRIMARY IS 2723
:OME PLANT IS CLEARING
(PLANT NUMBER 1 PLANT CODE B)
'ORMULA NUMBER IS F6869 (ACTIVE)

:NITIAL INGREDIENT LIST

	R#/F#	PRODUCT/R# DESC.
7.5500%	R-598	
11.3000%	R-605	
9.5500%	R-644	
5.3000%	R-784	
58.4200%	R-2064	
7.8800%	F7067	PR 945E

to metal spun on Bullet & label

:NTER NEXT COMMAND:
: = EXIT THIS FORMULA "EXPLOSION"
: = COMBINE % OF LIKE INGREDIENTS
' = REDISPLAY PRESENT DATA WITH POUNDS COMPUTED
: = DISPLAY INGREDIENT NAMES
'ARRIAGE RETURN = "EXPLODE" TO NEXT LEVEL, IF POSSIBLE

	R#/F#	PRODUCT/R# DESC.
	- 2723 -	F- 8063 -11-5-84
4 (5.0) 7.5500%	R-598	PENTACHLOROPHENOL, PRILLED 5.2 - 7.0
3 11.3000%	R-605	TALL OIL, FATTY ACID, LOW ROSIN
8 (8.6) 9.5500%	R-644	2,4,D ACID ISO-OCTYL-ESTER 8.6 - 9.6
0 (4.8) 5.3000%	R-784	BROMACIL COMPOSITION 95% 4.8 - 5.2
58.4200%	R-2064	AROMATIC HYDROCARBON SOLVENT
7.8800%	F7067	PR 945E

:NTER NEXT COMMAND:
: = EXIT THIS FORMULA "EXPLOSION"
: = COMBINE % OF LIKE INGREDIENTS
' = REDISPLAY PRESENT DATA WITH POUNDS COMPUTED
: = DISPLAY INGREDIENT NAMES
:ARRIAGE RETURN = "EXPLODE" TO NEXT LEVEL, IF POSSIBLE
:

:HERE IS ANOTHER FORMULA FOR THIS PRODUCT.
:NTER
YES TO DISPLAY NEXT FORMULA
F# TO DISPLAY SPECIFIC FORMULA FOR CURRENT PRODUCT
CARRIAGE RETURN TO PROMPT FOR NEXT PRODUCT

?
.NTER PRODUCT-NAME 2724
:URRENT PLT 1 PRIMARY MANUFACTURING FORMULA IS F# F6870

'RODUCT IS 2724 PRIMARY IS 2724
:OME PLANT IS CLEARING
PLANT NUMBER 1 PLANT CODE B)

Resale Products

Product Bulletin

NALKIL® 2725

LIQUID WEED KILLER

Product Benefits

NALKIL 2725 is the easily dilutable formulating concentrate for NALKIL 2703. The diluted product is a fully solubilized bromacil formulation designed to provide fast, dramatic topkill, broad spectrum systemic action, and powerful long-lasting residual control. NALKIL 2725 contains ENDRIFT®, Nalco's exclusive antimist agent. This helps assure more efficient coverage and better results for your weed control investment.

Principal Uses

NALKIL 2725 is a concentrated herbicide for formulating use only. When diluted, the product is a highly effective, persistent, nonselective general herbicide for extended control of a wide range of undesirable weeds and grasses. It is recommended for noncropland areas such as railroad rights-of-way, yards, and shops; industrial sites; ground tanks and other storage facilities; under and around bridges; along fences or pipelines; wherever grasses and weeds might interfere with drainage, create a fire or other hazard, or provide an unsightly appearance. It is approved for use under EPA Registration Number 1706-156 and EPA Est. 1706-IL-1.

General Description

Form	Liquid
Color	Amber
Odor	Hydrocarbon
Flash Point (TOC)	126°F

Active Ingredients	
Petroleum oil	69.49%
2, 4-Dichlorophenoxyacetic acid, isooctyl ester*	6.46%
Bromacil (5-bromo-3-sec-butyl-6-methyluracil)	5.66%
Pentachlorophenol	4.61%
Other chlorophenols	0.54%
Inert Ingredients	13.24%
Total	100.00%

*2, 4-Dichlorophenoxyacetic acid equivalent: 4.29%

Dosage

This product is for formulation use only.

It is a violation of federal law to use this product in a manner inconsistent with these directions.

To dilute for end use, add 7.0 gallons of NALKIL 2725 to 36.5 gallons of phytotoxic oil vehicle, and mix thoroughly.

Storage

Do not store near food, feed, fertilizer, seeds, insecticides, or pesticides.

(Continued on Reverse Side)

NALCO CHEMICAL COMPANY
SPECIALTY CHEMICALS
2901 BUTTERFIELD ROAD C OAK BROOK, ILLINOIS 60521

SUBSIDIARIES IN ARGENTINA, AUSTRIA, BRAZIL, CHILE, COLOMBIA, ECUADOR, FINLAND, FRANCE, HOLLAND, HONG KONG, ITALY, PHILIPPINES, SAUDI ARABIA, SPAIN, SWEDEN, VENEZUELA AND WEST GERMANY • AFFILIATES IN AUSTRALIA, CANADA, JAPAN, MEXICO, SINGAPORE, SOUTH AFRICA, TAIWAN, UNITED KINGDOM, AND THE UNITED STATES

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... PRESENT DATA WITH POUNDS COMPUTED
N = DISPLAY INGREDIENT NAMES
CARRIAGE RETURN = "EXPLODE" TO NEXT LEVEL, IF POSSIBLE

	R#/F#	PRODUCT/R# DESC.
5.6300%	R-598	PENTACHLOROPHENOL, PRILLED
12.1400%	R-605	TALL OIL, FATTY ACID, LOW ROSIN
7.1400%	R-644	2,4,D ACID ISO-OCTYL-ESTER
6.2500%	R-784	BROMACIL COMPOSITION 95%
62.9600%	R-2064	AROMATIC HYDROCARBON SOLVENT
5.8800%	F7067	PR 945E

100

ENTER NEXT COMMAND:
E = EXIT THIS FORMULA "EXPLOSION"
C = COMBINE % OF LIKE INGREDIENTS
P = REDISPLAY PRESENT DATA WITH POUNDS COMPUTED
N = DISPLAY INGREDIENT NAMES
CARRIAGE RETURN = "EXPLODE" TO NEXT LEVEL, IF POSSIBLE

THERE IS ANOTHER FORMULA FOR THIS PRODUCT.
ENTER
YES TO DISPLAY NEXT FORMULA
F# TO DISPLAY SPECIFIC FORMULA FOR CURRENT PRODUCT
CARRIAGE RETURN TO PROMPT FOR NEXT PRODUCT

? ENTER PRODUCT-NAME ENTER F - FOR FORMULA NUMBER RETRIEVAL
P - FOR PRODUCT-NAME RETRIEVAL
"RETURN" - TO EXIT FROM PROGRAM

... OF EXECUTION
CPU TIME: 3.26 ELAPSED TIME: 2:46.53
EXIT

..
Job 79 User NOWAK, J.A. [6001,1143]
Logged-off TTY33 at 12:

N[illegible]

2702 LIQ[illegible] WI[illegible] ENDRIF[illegible]

W[illegible] K[illegible]

[illegible] before [illegible] Do not store near [illegible] Destroy when [illegible] Do [illegible] favor drift [illegible] equipment or disposal of [illegible]

ACTIVE INGREDI[illegible]	
Petroleum oil	96.07[illegible]
Bromacil (5-bro[illegible]yl-6-methylurasil)	[illegible]
Pentachlorophe[illegible]	[illegible]
Other chlorophe[illegible]	[illegible]
INERT INGREDIE[illegible]	2.0[illegible]
Total	100.00[illegible]

[illegible] WARNING: KEEP OUT OF THE REACH OF CHILDREN. HARMFUL IF [illegible] WALLOWED. CAUSES SKIN IRRITATION. [illegible] skin, eyes, and [illegible] when not in [illegible] large amounts of [illegible] clothing before [illegible]

[illegible]ration No. [illegible]

NALCO CHEMICAL COMPANY

6216 WES[illegible] PLACE [illegible] AGO, ILLINOIS 60638

EPA est: 1706-[illegible]

14.1.11.00.

Nalkil® 2702

Liquid Weed Killer with Endrift

(EPA Registration Number 1706-96-AA)

Nalkil 2702 Liquid Weed Killer is a potent, easy-to-use weed and brush control chemical. Its fully solubilized bromacil formulation provides fast, dramatic top-kill and powerful long-lasting residual control. Nalkil 2702 comes ready-to-use. You have no delays for adding water, mixing or agitating. Nalkil 2702 contains Endrift — Nalco's exclusive antimist agent that assures more efficient coverage and better results for your weed control investment.

Principal Uses

Nalkil 2702 is a highly effective, persistent, non-selective, general herbicide for extended control of a wide range of undesirable weeds and grasses. It is recommended for non-cropland areas such as railroad rights-of-way, yards and shops; industrial sites; tanks and other storage facilities; bridges; along fences or pipelines; wherever grasses and weeds might interfere with drainage, create a fire or other hazard, or provide an unsightly appearance.

General Description

Active Ingredients:

Petroleum oil	96.07%
Bromacil (5-bromo-3-sec-butyl-6-methyluracil)	0.97%
Pentachlorophenol	0.79%
Other chlorophenols	0.09%
Inert Ingredients	2.08%
Total	100.00%

Nalkil 2702 is composed of chlorinated phenols, Bromacil (5-bromo-3-sec-butyl-6-methyluracil), and Endrift in a phytotoxic oil vehicle. The unique oil vehicle combines the important properties of low volatility with the ability to rapidly penetrate vegetation. The vehicle is a non-conductor of electricity and its use precludes any shorting of signal circuits or electrical connections. Nalkil 2702 provides a contact or top-kill of all succulent vegetation, while root absorption results in broadleaf and grass root kill as well as extended residual control. Insolubility of the herbicide in water assures its full effect regardless of rainfall after application. Endrift antimist helps reduce previously uncontrollable drift and misting characteristics typical of liquid weed control chemicals. Endrift works to keep liquid chemical applications within the desired spray pattern. The end result is a greater concentration of treatment per acre, less danger of drift damage to adjacent crops and other desirable vegetation, and less drift on personnel and equipment.

Dosage and Application

Use Nalkil 2702 at the rate of 43.5 gallons per acre, which provides 4 lb/acre of Bromacil (5-bromo-3-sec-butyl-6-methyluracil).

(Continued on Reverse Side)

Nalco Chemical Company
Specialty Chemicals
2901 Butterfield Road
Oak Brook, Illinois 60521

Registered Trademarks of Nalco Chemical Company

PLANT OPERATING PROCEDURE

PLT# 1 PRODUCT: 2702E LIQ FORMULA # F6291 DATE: 5/ 8/79

STEP NO.	ITEM NO.	PRE-MIX CODE	MATERIAL CODE	MATERIAL DESCRIPTION	INGREDIENT PERCENT	APRX. AMT.
3	1		R-667		94.8500	
3	2		R-605		2.1000	
3	3		PR 945ELIQ	(ANY FORMULA)	1.0000	
5	1		R-598		0.9700	
5	2		R-784		1.0800	
				TOTAL INPUT %	100.0000	

PRECAUTIONS:

R-667, R-605, PR-945E - All of these raw materials are flammable. Wear rubber gloves and goggles when handling. The R-667 requires a cartridge respirator with black cartridges.

R-598 - Wear goggles, rubber gloves and cartridge respirator with pesticide cartridge, color pea green. When sampling batch wear respirator, goggles, gloves and apron.

R-784 - Wear goggles, rubber gloves, and toxic dust mask when handling. Also, wear cartridge respirator with pesticide cartridge color pea green, and when sampling batch wear respirator, goggles, gloves and apron.

QUALITY CONTROL
REPORT TO R. J. Michalski

From: C. E. Mueller

Date: March 3, 1970

Copies to: E. Moodie
C. Hippchen
J. Burke

Subject: Project T-8-A
NalKil 2702/E

Specific Gravity @ 68°F.	=	0.910
Appearance	=	Clear
Color NPA	=	>8
Viscosity @ 77°F.	=	2.9
Cloud Point	=	None
Pour Point	=	-32°F.
Freeze - Thaw	=	-32°F.
Flash Point C.O.C.	=	137°F.
Fire Point C.O.C.	=	138°F.
Cent. Sed.	=	<0.1
Storage 1 Day 120°F.	=	NVC
75°F.	=	Sed.
40°F.	=	NVC
10°F.	=	NVC
7 Days 120°F.	=	NVC
75°F.	=	Sed.
40°F.	=	NVC
10°F.	=	Sediment on bottom

Coupon Corrosion Test
Liquid = 0.5 mpy - NVC to coupon or product
Vapor = 0.5 mpy - NVC to coupon

C. E. Mueller

C. E. Mueller

cjp

NALCON 7631

MICROORGANISM CONTROL CHEMICAL

ACTIVE INGRE[illegible]

Potassium Pent[illegible]

Potassium [illegible]

Potassium [illegible]

INERT INGR[illegible]

Total [illegible]

*Inert ingredients [illegible]

1 gallon contains [illegible] Potassium [illegible]

EPA Registration No. [illegible]

[illegible] NALCON 7631 (1[illegible]) [illegible] per 10,000 [illegible] 600 ppm NALCON 7631 [illegible] of glue) [illegible] 100 [illegible] (10.[illegible]–20.[illegible] gallons) NALCON 7631 per 10,[illegible] of [illegible]

Feed NALCON 7631 [illegible] from [illegible] preservation of lumber, steam spray application is preferred. Technical [illegible] individual site problems obtainable from [illegible] representative.

NOTE: NALCON [illegible] DED FOR INDUSTRI[illegible]

[illegible] by cleaning [illegible]

[illegible] REACH [illegible] INJURY [illegible] IRRITATION [illegible] gloves [illegible] ventilation. Keep container [illegible] contact, [illegible] flush eyes or skin with large amounts of [illegible] 15 minutes; for eyes [illegible] medical attention. Remove [illegible]

NALCO CHEMICAL COMPANY

6216 WES[illegible]TH P[illegible] [illegible]ICAGO [illegible] 60638

EPA Est. 1706-[illegible]

14. [illegible]02.2

Clean Harbors

Form No. LA

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List _____

HAZARD CODE F039

WASTE SOURCE
WASTE GENERATOR BFI
WASTE DESCRIPTION LEACHATE
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE CLOUDY, BROWN WATER MISCIBILITY +
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH.	TEST	As Rec.	LEACH.
pH	7.0		Ag, ppm		
% TOTAL SOLIDS	2.48		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	6.4	
% SUSPENDED SOLIDS	0.21		Cd, ppm	0.3	
% SETTLEABLE SOLIDS			Cr, ppm	3.0	
FLASH POINT °F	>140		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	<10		Cu, ppm	4.8	
PHENOLS, ppm	<10		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	2.1	
BROMIDE, ppm			Pb, ppm	6.3	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	8400		Zn, ppm	46.0	
BOD, ppm			Fe, ppm	122	
ACIDITY mg/l as $CaCo_3$			Tl, ppm	<0.1	
ALKALINITY mg/l as $CaCo_3$			NH_3	ND	
CYANIDE, ppm (TOTAL)	<1.0		TOX, ppm		
CYANIDE, ppm (RELEASE)			HOC, ppm		
SULFIDE, ppm (TOTAL)	<10.0		TOC, ppm	4280	
SULFIDE, ppm (RELEASE)					

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11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List _____

HAZARD CODE K001

WASTE SOURCE
WASTE GENERATOR
WASTE DESCRIPTION BOTTOM SLUDGE (WOOD PRESERVATION)
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE DARK JUICY, PHENOL ODOR WATER MISCIBILITY +
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH
pH	10.1		Ag, ppm	<0.1	
% TOTAL SOLIDS	18.03		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	2.2	
% SUSPENDED SOLIDS	16.40		Cd, ppm	0.3	
% SETTLEABLE SOLIDS			Cr, ppm	7.9	
FLASH POINT °F	>140		Cr Hexl, ppm	—	
OIL AND GREASE, ppm	4850		Cu, ppm	0.1	
PHENOLS, ppm	3200		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	42.0	
BROMIDE, ppm			Pb, ppm	1.2	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	32,400		Zn, ppm	2.3	
BOD, ppm			Fe, ppm	1200	
ACIDITY mg/l as $CaCO_3$			Tl, ppm	<0.1	
ALKALINITY mg/l as $CaCO_3$			NH_3	ND	
CYANIDE, ppm (TOTAL)	<1.0		TCE, ppm		
CYANIDE, ppm (RELEASE)			PCB, ppm		
SULFIDE, ppm (TOTAL)	<1.0		TCL, ppm		
SULFIDE, ppm (RELEASE)			PENTACHLOROPHENOL	4200	

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Chicago, Illinois 60617
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CHI # _____

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HAZARD CODE _____

K007

WASTE SOURCE
WASTE GENERATOR ACME COATINGS
WASTE DESCRIPTION WASTEWATER TREATMENT SLUDGE (IRON BLUE PIGMENTS)
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE BLUE SOLID WATER MISCIBILITY +
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH
pH	9.4 (100% Sol.)		Ag, ppm	<1.0	
% TOTAL SOLIDS	92.4		As, ppm	0.1	
% DISSOLVED SOLIDS			Ba, ppm	18.1	
% SUSPENDED SOLIDS	75.4		Cd, ppm	0.23	
% SETTLEABLE SOLIDS			Cr, ppm	21,400	
FLASH POINT °F	>140		Cr (Hex), ppm	—	
OIL AND GREASE, ppm			Cu, ppm	2.8	
PHENOLS, ppm	4.5		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	<1.0	
BROMIDE, ppm			Pb, ppm	5920	
PHOSPHATE ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	—		Zn, ppm	428	
BOD, ppm			Fe, ppm	22,200	
ACIDITY mg/l as $CaCO_3$			Tl, ppm	<0.1	
ALKALINITY mg/l as $CaCO_3$			NH_3	ND	
CYANIDE ppm (TOTAL)	<1.0		TOX ppm		
CYANIDE, ppm (RELEASE)			HOC, ppm		
SULFIDE, ppm (TOTAL)	<1.0		TOV ppm		
SULFIDE, ppm (RELEASE)					

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Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List _____

HAZARD CODE K015

WASTE SOURCE
WASTE GENERATOR OLIN
WASTE DESCRIPTION STILL BOTTOMS
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE BLACK RESIDUE - SOLVENT SMELL WATER MISCIBILITY —
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH.	TEST	As Rec.	LEACH
pH	—		Ag, ppm	<1.0	
% TOTAL SOLIDS	48.2		As, ppm		
% DISSOLVED SOLIDS			Ba, ppm	<2.0	
% SUSPENDED SOLIDS			Cd, ppm	<1.0	
% SETTLEABLE SOLIDS			Cr, ppm	<2.0	
FLASH POINT °F	>140°		Cr, Hexl, ppm	—	
OIL AND GREASE, ppm			Cu, ppm		
PHENOLS, ppm	<1.0		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	<2.0	
BROMIDE, ppm			Pb, ppm	<2.0	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<1.0	
COD, ppm	—		Zn, ppm		
BOD, ppm			Fe, ppm		
ACIDITY mg/l as $CaCO_3$			Tl, ppm	<2.0	
ALKALINITY mg/l as $CaCO_3$			NH	ND	
CYANIDE ppm (TOTAL)	<1.0		TOX, ppm		
CYANIDE, ppm (RELEASE)			HCC, ppm		
SULFIDE ppm (TOTAL)	<100		TOC, ppm		
SULFIDE ppm (RELEASE)			TOLUENE	4200	

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As of the date of submittal of this Application, CHCI has not developed comprehensive anaytical data for pesticide-bearing wastes intended for storage and transfer operations. Such analyses shall be submitted to IEPA as soon as they become available.

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11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List _____

HAZARD CODE K100

WASTE SOURCE
WASTE GENERATOR BETHLEHEM STEEL
WASTE DESCRIPTION LEACHING SOLUTION (SECONDARY LEAD SMELTING)
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR APPEARANCE YELLOW, SLIGHTLY CLOUDY WATER MISCIBILITY +
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH
pH	1.2		Ag, ppm	0.6	
% TOTAL SOLIDS	9.30		As, ppm	<1.0	
% DISSOLVED SOLIDS			Ba, ppm	2.0	
% SUSPENDED SOLIDS	0.10		Cd, ppm	0.8	
% SETTLEABLE SOLIDS			Cr, ppm	382	
FLASH POINT °F	>140		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	296		Cu, ppm	16.0	
PHENOLS, ppm	<2.0		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	52.0	
BROMIDE ppm			Pb, ppm	26,420	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.2	
COD, ppm	29,600		Zn, ppm	30.4	
BOD, ppm			Fe, ppm	480	
ACIDITY mg/l as $CaCO_3$			Tl, ppm	<2.0	
ALKALINITY mg/l as $CaCO_3$			NH_3	ND	
CYANIDE ppm (TOTAL)	<1.0		TOX, ppm		
CYANIDE ppm (RELEASE)			HOC, ppm		
SULFIDE ppm (TOTAL)	<10.0		TOC ppm	4661	
SULFIDE ppm (RELEASE)					

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11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List _____

HAZARD CODE K049

WASTE SOURCE
WASTE GENERATOR AMERICAN RECOVERY
WASTE DESCRIPTION SLOP OIL SOLIDS
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE OILY SOLIDS WATER MISCIBILITY —
% FLOATER 52 % OIL ON ACIDIFICATION 12
% FREE OIL 10

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH
pH	—		Ag, ppm	<0.1	
% TOTAL SOLIDS	38.4		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	14.4	
% SUSPENDED SOLIDS	12.2		Cd, ppm	0.8	
% SETTLEABLE SOLIDS			Cr, ppm	2480	
FLASH POINT °F	>140		Cr (Hex), ppm	2100	
OIL AND GREASE, ppm	SEE FREE OIL		Cu, ppm	215	
PHENOLS, ppm	12.6		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	<2.0	
BROMIDE, ppm			Pb, ppm	3.8	
PHOSPHATE, ppm (TOTAL)			Se, ppm	0.13	
COD, ppm	—		Zn, ppm	438	
BOD, ppm			Fe, ppm	1680	
ACIDITY mg/l as $CaCO_3$			Tl, ppm	<2.0	
ALKALINITY mg/l as $CaCO_3$			NH_3	ND	
CYANIDE, ppm (TOTAL)	<1.0		TOX, ppm	<10	
CYANIDE, ppm (RELEASE			THOC, ppm		
SULFIDE, ppm (TOTAL)	<100		TOV, ppm		
SULFIDE, ppm (RELEASE)					

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Form 160 LAS 7

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List _____

HAZARD CODE K062

WASTE SOURCE
WASTE GENERATOR KROPP FORGE
WASTE DESCRIPTION PICKLE LIQUOR
RECEIPT DATE VOLUME 5 DRS/QTR.

WASTE CHARACTERISTICS

COLOR/APPEARANCE DARK GREEN, CLOUDY WATER MISCIBILITY +
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH.	TEST	As Rec.	LEACH
pH	<1.0		Ag, ppm	3.7	
% TOTAL SOLIDS	28.40		As, ppm	0.70	
% DISSOLVED SOLIDS			Ba, ppm	6.70	
% SUSPENDED SOLIDS	0.09		Cd, ppm	0.60	
% SETTLEABLE SOLIDS			Cr, ppm	732	
FLASH POINT °F	>140		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	<1.0		Cu, ppm	94	
PHENOLS, ppm	1.0		Hg, ppb	443	
CHLORIDE, ppm			Ni, ppm	408	
BROMIDE, ppm			Pb, ppm	6.7	
PHOSPHATE, ppm (TOTAL)			Se, ppm	0.43	
COD, ppm	3600		Zn, ppm	160	
BOD, ppm			Fe, ppm	4400	
ACIDITY mg/l as $CaCo_3$			Tl, ppm	4.9	
ALKALINITY mg/l as $CaCo_3$			NH_3	ND	
CYANIDE ppm (TOTAL)	<1.0		TOX, ppm		
CYANIDE, ppm (RELEASE)			THOC, ppm		
SULFIDE, ppm (TOTAL)	<1.0		TOV, ppm		
SULFIDE, ppm (RELEASE)					

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ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List _____

HAZARD CODE K087

WASTE SOURCE
WASTE GENERATOR ACME STEEL
WASTE DESCRIPTION TAR SLUDGE (COKING)
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE THICK SLURRY, PHENOL SMELL WATER MISCIBILITY —
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH
pH			Ag, ppm	<1.0	
% TOTAL SOLIDS	9.48		As, ppm		
% DISSOLVED SOLIDS			Ba, ppm	<2.0	
% SUSPENDED SOLIDS	8.40		Cd, ppm	<1.0	
% SETTLEABLE SOLIDS			Cr, ppm	<2.0	
FLASH POINT °F	>140		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	14,600		Cu, ppm		
PHENOLS, ppm	8600		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm		
BROMIDE, ppm			Pb, ppm	<2.0	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<1.0	
COD, ppm	—		Zn, ppm		
BOD, ppm			Fe, ppm		
ACIDITY mg/l as $CaCo_3$			Tl, ppm	<2.0	
ALKALINITY mg/l as $CaCo_3$			NH_3	ND	
CYANIDE, ppm (TOTAL)	12.4		TOX ppm		
CYANIDE, ppm (RELEASE)			HOC ppm		
SULFIDE, ppm (TOTAL)	42.0		TOV ppm		
SULFIDE, ppm (RELEASE)					

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11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List _____

HAZARD CODE K086

WASTE SOURCE
WASTE GENERATOR PCIA
WASTE DESCRIPTION CAUSTIC INK WASH
RECEIPT DATE VOLUME 5 DR/MO.

WASTE CHARACTERISTICS

COLOR/APPEARANCE GREEN, THIN LIQUID WATER MISCIBILITY +
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH
pH	8.2		Ag, ppm	0.10	
% TOTAL SOLIDS	1.67		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	6.60	
% SUSPENDED SOLIDS	0.23		Cd, ppm	<0.2	
% SETTLEABLE SOLIDS			Cr, ppm	0.52	
FLASH POINT °F	>140		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	123		Cu, ppm	2.53	
PHENOLS, ppm	3.5		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	14.8	
BROMIDE, ppm			Pb, ppm	2.58	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	28,800		Zn, ppm	21.2	
BOD, ppm			Fe, ppm	64.0	
ACIDITY mg/l as $CaCO_3$			Tl, ppm	<0.1	
ALKALINITY mg/l as $CaCO_3$			NH_3	ND	
CYANIDE, ppm (TOTAL)	<1.0		TOX, ppm		
CYANIDE, ppm (RELEASE)			TOC, ppm		
SULFIDE, ppm (TOTAL)	<1.0		TOV, ppm		
SULFIDE, ppm (RELEASE)					

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APPENDIX C-1, DATA SHEET #59

VETERINARY PHARMACUTICALS - K084, K101-102

CleanHarbors

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11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List _____

HAZARD CODE K084

WASTE SOURCE
WASTE GENERATOR ABBOTT LABS
WASTE DESCRIPTION WASTEWATER TREATMENT SLUDGE
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE GREY SLURRY WATER MISCIBILITY +
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH
pH	9.0 (10% sol.)		Ag, ppm	0.2	
% TOTAL SOLIDS	48.0		As, ppm	8400	
% DISSOLVED SOLIDS			Ba, ppm	<0.1	
% SUSPENDED SOLIDS			Cd, ppm	0.1	
% SETTLEABLE SOLIDS			Cr, ppm	6.0	0.2
FLASH POINT °F	>140		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	2280		Cu, ppm	1.3	
PHENOLS, ppm	<1.0		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	0.4	
BROMIDE, ppm			Pb, ppm	0.59	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	—		Zn, ppm	1.0	
BOD, ppm			Fe, ppm	3.0	
ACIDITY mg/l as $CaCO_3$			Tl, ppm	<1.0	
ALKALINITY mg/l as $CaCO_3$			NH_3	NO	
CYANIDE ppm (TOTAL)	<1.0		TOX, ppm		
CYANIDE, ppm (RELEASE)			HOC, ppm		
SULFIDE, ppm (TOTAL)	<1.0		TOV, ppm		
SULFIDE, ppm (RELEASE)					

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11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List _____

HAZARD CODE K106

WASTE SOURCE
WASTE GENERATOR AIR PRODUCTS
WASTE DESCRIPTION TREATMENT SLUDGE (CHLORINE PRODUCTION)
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE DARK SOLID, CHLORINE SMELL WATER MISCIBILITY +
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH
pH	10.1 (10% SOL)		Ag, ppm	0.5	
% TOTAL SOLIDS	42.2		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	<0.1	
% SUSPENDED SOLIDS			Cd, ppm	0.1	
% SETTLEABLE SOLIDS			Cr, ppm	<0.1	
FLASH POINT °F	>140		Cr (Hex), ppm	—	
OIL AND GREASE, ppm			Cu, ppm	20.0	
PHENOLS, ppm	<1.0		Hg, ppb	44,200	
CHLORIDE, ppm			Ni, ppm	0.1	
BROMIDE, ppm			Pb, ppm	0.41	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	—		Zn, ppm	0.6	
BOD, ppm			Fe, ppm	0.1	
ACIDITY mg/l as $CaCO_3$			Tl, ppm	<2.0	
ALKALINITY mg/l as $CaCO_3$			NH_3	ND	
CYANIDE, ppm (TOTAL)	<1.0		TOX, ppm		
CYANIDE, ppm (RELEASE)			HOC, ppm		
SULFIDE, ppm (TOTAL)	42.0		TOV, ppm		
SULFIDE, ppm (RELEASE)					

COMMENTS THIS REPORT HAS BEEN PREPARED FOR THE EXCLUSIVE USE AND BENEFIT OF CLEAN HARBORS NO REPRESENTATION CONCERNING SAMPLE VALIDITY OR ANALYTICAL COMPLETENESS IS HEREBY MADE TO ANY OTHER PERSON RECEIVING THIS REPORT

Clean Harbors

Form No. LAS

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List: _____

HAZARD CODE K046 _____

WASTE SOURCE
WASTE GENERATOR U.S. ARMY
WASTE DESCRIPTION WASTEWATER TREATMENT SLUDGE (EXPLOSIVES MFG.)
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE GREY/BROWN SOLID WATER MISCIBILITY +
% FLOATER — % OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH.	TEST	As Rec.	LEACH
pH	10.8 (10% SOL.)		Ag, ppm	1.2	
% TOTAL SOLIDS	38.6		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	14.8	
% SUSPENDED SOLIDS			Cd, ppm	0.2	
% SETTLEABLE SOLIDS			Cr, ppm	4.2	
FLASH POINT °F	>140		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	1428		Cu, ppm	8.3	
PHENOLS, ppm	2.8		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	6.1	
BROMIDE, ppm			Pb, ppm	16,870	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	—		Zn, ppm	44.8	
BOD, ppm			Fe, ppm	127	
ACIDITY mg/l as $CaCO_3$			Tl, ppm	<0.1	
ALKALINITY mg/l as $CaCO_3$			NH_3	ND	
CYANIDE ppm (TOTAL)	<1.0		TOX ppm		
CYANIDE, ppm (RELEASE)			HOC, ppm		
SULFIDE, ppm (TOTAL)	98		TOV ppm		
SULFIDE, ppm (RELEASE)	<10.0				

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APPENDIX C-1, DATA SHEET #62

NON-HAZARDOUS WASTES - WASTE OIL

Clean Harbors

Form No LAS

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # _____

PERMIT # _____ California List _____

HAZARD CODE NON HAZ

WASTE SOURCE
WASTE GENERATOR A.T.&T. TECHNOLOGIES
WASTE DESCRIPTION WASTE OIL
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE OIL, SOME SOLIDS WATER MISCIBILITY —
% FLOATER <1 OIL ON ACIDIFICATION 99
% FREE OIL 99

TEST	As Rec.	LEACH	TEST	As Rec.	LEACH
pH	—		Ag, ppm	<1.0	
% TOTAL SOLIDS	4.85		As, ppm		
% DISSOLVED SOLIDS			Ba, ppm	<2.0	
% SUSPENDED SOLIDS	1.20		Cd, ppm	<1.0	
% SETTLEABLE SOLIDS			Cr, ppm	<1.0	
FLASH POINT °F	>140		Cr Hexl, ppm	—	
OIL AND GREASE, ppm	SEE FREE OIL		Cu, ppm		
PHENOLS, ppm	<1.0		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm		
BROMIDE, ppm			Pb, ppm	<1.0	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<1.0	
COD, ppm	—		Zn, ppm		
BOD, ppm			Fe, ppm		
ACIDITY mg/l as $CaCo_3$			Mn, ppm		
ALKALINITY mg/l as $CaCo_3$			Mo, —	ND	
CYANIDE, ppm (TOTAL)	<1.0		TOX, ppm	<10	
CYANIDE, ppm (RELEASE)			TOC, ppm		
SULFIDE, ppm (TOTAL)	<1.0		TSS, ppm		
SULFIDE, ppm (RELEASE)			BTU	14,400	
			PCB	<10	

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APPENDIX C-1, DATA SHEET #63

NONHAZARDOUS WASTES - WASTE OIL
P-CODE WASTES [(40 CFR 261.33(d)]

DU PONT

MATERIAL SAFETY DATA SHEET

RECEIVED AUG 0 1 1990

IDENTIFICATION

NAME
Formaldehyde Solutions

SYNONYMS
Formalin; Methanal

CAS NAME
Formaldehyde Solutions

ID. NOS./CODES
NIOSH Registry No.: LP8925000

MANUFACTURER/DISTRIBUTOR
Du Pont Company

ADDRESS
Wilmington, DE 19898

CHEMICAL FAMILY
Aldehyde

FORMULA
CH_2O

TSCA INVENTORY STATUS
Reported/Included

SARA/TITLE III STATUS
See ADDITIONAL INFORMATION and HAZARDOUS COMPONENTS sections

PRODUCT INFORMATION PHONE
(800) 441-9442

MEDICAL EMERGENCY PHONE
(800) 441-3637

TRANSPORTATION EMERGENCY PHONE
CHEMTREC (800) 424-9300

PHYSICAL DATA

BOILING POINT, 760 mmHg
94.3 to 100°C (201 to 212°F)

SPECIFIC GRAVITY
1.08 to 1.13

VAPOR DENSITY (Air = 1)
~1

pH INFORMATION
2.8 to 4.0

FORM
Liquid

COLOR
Colorless

MELTING POINT
Polymerizes and separates below 0 to 67°C (32 to 153°F)

VAPOR PRESSURE
23 to 26 mmHg at 25°C (77°F)
39 to 42 mmHg at 37.8°C (100°F)

SOLUBILITY IN WATER
100%

EVAPORATION RATE (Butyl Acetate = 1)
Similar to water; >1

APPEARANCE
Clear (turns milky on cooling)

ODOR
Pungent

HAZARDOUS COMPONENTS

MATERIAL(S)	CAS NO.	APPROXIMATE %
Formaldehyde*	50-00-0	22-56
Methanol*	67-56-1	1-15

*Regulated as Toxic Chemicals under Section 313 of Title III/SARA, and 40 CFR Part 372.

NONHAZARDOUS COMPONENTS

MATERIAL(S)	CAS NO.	APPROXIMATE %
Water	7732-18-5	42-77

HAZARDOUS REACTIVITY

INSTABILITY
No known hazardous instability.

INCOMPATIBILITY
Reacts with many compounds. Reaction with phenol, strong acids, or alkalis may be violent. Reaction with hydrochloric acid may form bis-chloromethyl ether, an OSHA regulated carcinogen.

DECOMPOSITION
Occurs slowly at elevated temperatures, releasing formaldehyde gas.

POLYMERIZATION
Nonhazardous polymerization may occur at low temperatures, forming paraformaldehyde, a white solid.

FIRE AND EXPLOSION DATA

FLASH POINT
54 to 88°C (129 to 192°F) **METHOD** TCC

Grade	°C	°F
USP 37-7	69	156
USP 37-11	60	140
USP 37-13	58	137
USP 37-15	56	132
USP 27-7	70	161
LM 22	88	192
LM 37	83	181
LM 40	82	180
LM 44	80	176
LM 45	80	176
LM 50	79	174
LM 52	77	171
LM 56	73	163
HM 46	54	129

FLAMMABLE LIMITS IN AIR, % BY VOL.
LOWER 7
UPPER 73

XPLOSION DATA (cont'd)

IG. TION TEMPERATURE
C (795°F)

AUTODECOMPOSITION TEMPERATURE
Not available.

ial AIT's can be affected by the concentration of vapors and oxygen, vapor/air act time, pressure, volume, catalytic impurities, etc. Process conditions should be vzed to determine if the AIT may be higher or lower.

AND EXPLOSION HAZARDS
A Class II or IIIA Combustible Liquid. Follow appropriate National Fire ection Association (NFPA) codes.

GUISHING MEDIA
ohol" foam, dry chemical, carbon dioxide (CO_2), water spray.

AL FIREFIGHTING INSTRUCTIONS
container with water spray or fog to help absorb escaping fumes. Evacuate cted area. Stay upwind and avoid contact with smoke and fumes. If contact ot be avoided, wear personal protective equipment (see page 6) including chemical sh goggles and air mask with breathing air supply. Runoff from fire control may e pollution.

AZARD INFORMATION

CIPAL HEALTH HAZARDS (Including Significant Routes, Effects, Symptoms of re are, and Medical Conditions Aggravated by Exposure)

ses eye burns. Harmful if inhaled or absorbed through skin—causes general tissue age. Causes skin, nose, throat, and lung irritation. May cause allergic skin tion. May be fatal or cause blindness if swallowed. Cannot be made nonpoisonous.

maldehyde:

lation 4-hour LC_{50}:	250 ppm in rats
absorption LD_{50}:	270 mg/kg in rabbits
LD_{50}:	500 mg/kg in rats

maldehyde is a mild to moderate skin irritant, is an eye irritant and can produce nanent eye damage, and skin sensitization in animals. Toxic effects described in nals from exposure by inhalation to the vapor or mist include severe irritation to upper respiratory tract and mucosal surfaces, eye irritation, and nonspecific cts such as weight loss and irritation. Toxic effects observed in animals from osure by ingestion include severe irritation to mucosal surfaces and decreased body ght. Tests in some animals demonstrate carcinogenic activity. Formaldehyde shows agenic activity in bacterial and mammalian cell culture test systems, but is erally negative in whole animal systems. Tests for teratogenic activity by several tes have been negative; however, one study indicated slight decreased fetal weights only at high dose levels expected to also cause maternal toxicity. No malforma- s were observed. The available data are inadequate to assess reproductive effects. ough limited studies do not suggest such effects.

yde solutions
contact with
ing, and blurring
ffects of
nausea,
mporary lung
tness of breath.
in individuals.
. A Soviet study
n textile
wever, these
tiated by other
in may have

d in animals
fects, kidney
xic effects
ffects, liver
cell cultures
effects in the
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nethanol is not

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y function;
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em may have

on Cancer as
at least limited
gram as
Industrial
ormaldehyde
inogen.
CGIH.
cause cancer.

Human health effects of overexposure by skin contact with formaldehyde solutions include irritation with discomfort or rash, or allergic skin rash. Eye contact with formaldehyde solutions may cause eye irritation with discomfort, tearing, and blurring of vision; or eye corrosion with corneal or conjunctival ulceration. Effects of overexposure to formaldehyde vapors may include discomfort, such as nausea, headache, or weakness; irritation of the upper respiratory passages; temporary lung irritation effects with cough, discomfort, difficulty breathing, or shortness of breath. On rare occasions, respiratory sensitization (asthma) has been reported in individuals. Gross overexposure by ingestion and, rarely, inhalation has been fatal. A Soviet study of questionable merit on women exposed to urea formaldehyde resin in textile processing noted effects on pregnant workers and their offspring. However, these effects could be explained by other factors and have not been substantiated by other studies. Individuals with preexisting diseases of the lungs, eyes, or skin may have increased susceptibility to the toxicity of excessive exposures.

Methanol:

Inhalation 1-hour LC_{50}:	145,000 ppm in rats
Skin absorption LD_{50}:	15,840 mg/kg in rabbits
Oral LD_{50}:	9100 mg/kg in rats

Methanol is a skin and eye irritant in animals. Toxic effects described in animals from exposure by inhalation include ocular effects, blindness, liver effects, kidney effects, heart effects, nasal discharges, and cardiovascular effects. Toxic effects observed in animals from exposures by ingestion include anaesthetic effects, liver effects, acidosis, and ocular effects. Tests in bacterial or mammalian cell cultures demonstrate no mutagenic activity. Methanol produced developmental effects in the offspring of rats exposed by inhalation to levels of 10,000 or 20,000 ppm during pregnancy. Behavioral effects were observed in the offspring of rats exposed to 2500 mg/kg/day in their drinking water (equivalent to human ingestion of 150 mL, a dose expected to be fatal). Because maternal effects in humans would also occur at these high oral and inhalation concentrations, it is concluded that methanol is not a significant hazard for the conceptus.

Human health effects of overexposure by skin or eye contact with methanol liquid may cause skin irritation with discomfort or rash; or eye irritation with discomfort, tearing, or blurring of vision. Inhalation, ingestion, or skin absorption of methanol may cause visual disturbances including blindness; temporary nervous system effects such as muscular tremors or dizziness, headache, confusion, incoordination, and loss of consciousness; nonspecific discomfort, such as nausea, headache, or weakness; acidosis; irritation of the upper respiratory passages; abnormal liver and kidney function; cardiovascular effects; or fatality from gross overexposure. Skin permeation can occur in amounts capable of producing the effects of systemic toxicity. Individuals with preexisting diseases of the retina, kidneys, liver or cardiovascular system may have increased susceptibility to the toxicity of excessive exposures.

CARCINOGENICITY

FORMALDEHYDE is listed by the International Agency for Research on Cancer as probably carcinogenic to humans, on the basis of animal evidence and at least limited human data (IARC group 2A). Listed by the National Toxicology Program as reasonably anticipated to be carcinogenic. Listed by ACGIH as an A2 Industrial Substance Suspect of Carcinogenic Potential for Man. OSHA, in its Formaldehyde Standard (29 CFR 1910.1048), considers formaldehyde a potential carcinogen. METHANOL is not listed as a carcinogen by IARC, NTP, OSHA, or ACGIH. Formaldehyde (gas) is a chemical known to the State of California to cause cancer.

EXPOSURE LIMITS [PEL (OSHA), TLV (ACGIH), AEL (DU PONT), ETC.]

Formaldehyde: OSHA 8-hour Time Weighted Average (TWA) = 1 ppm, 1.5 mg/m^3; the OSHA Short Term Exposure Limit (STEL) = 2 ppm, 3 mg/m^3 (15-minute TWA, see 29 CFR 1910.1048). The ACGIH TLV-TWA = 1 ppm, 1.2 mg/m^3; the ACGIH STEL = 2 ppm, 2.5 mg/m^3 (in its 1989-1990 "Notice of Intended Changes," ACGIH lists the TLV as 0.3 ppm, 0.45 mg/m^3, ceiling, with the STEL deleted. The Du Pont AEL 8- and 12-hour TWA = 1 ppm (15-minute TWA = 2 ppm).

Methanol: OSHA 8-hour Time Weighted Average (TWA) = 200 ppm, 260 mg/m^3; the OSHA Short Term Exposure Limit STEL = 250 ppm, 310 mg/m^3; ACGIH TLV-TWA = 200 ppm, 262 mg/m^3; the ACGIH STEL = 250 ppm, 328 mg/m^3. Also, in its "Notice of Intent to Establish," ACGIH lists Biological Exposure Indices for methanol in urine of 15 mg/L (end of shift), and for formic acid in urine of 80 mg/g creatinine (before the shift at end of workweek). The Du Pont Acceptable Exposure Limit (AEL) 8- and 12-hour TWA = 200 ppm. The OSHA, ACGIH, and Du Pont limits all carry an "Avoid Skin Contact" notation.

SAFETY PRECAUTIONS

Do not get in eyes.
Avoid contact with skin and clothing.
Avoid breathing mist or vapor.
Wash thoroughly after handling.

FIRST AID

In case of eye contact: Immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

In case of skin contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before reuse.

If inhaled: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

If swallowed: Induce vomiting immediately as directed by medical personnel. Following this, give activated charcoal slurry. Call a physician.

NOTE TO PHYSICIANS:

To prepare activated charcoal slurry, suspend 50 gm of activated charcoal in 400 mL of water in a bottle and shake well. Give 5mL/kg of body weight, or 350 mL for an average adult.

If significant quantities of methanol have been swallowed, a methanol antidote should be given orally. To prepare the antidote, make a solution using 100 mL of 100-proof ethyl alcohol (grain alcohol) in 2000 mL of water and give 1.5 mL/kg of body weight, or 100 mL for an average adult. Following this, at 2 hour intervals for 4 days, give the antidote (0.5-1.0 mL/kg of body weight, orally or intravenously) to reduce the metabolism of the methanol and to allow time for its excretion. Blood ethanol levels should be 1.0-1.5 mg/mL.

PROTECTION INFORMATION

GENERALLY APPLICABLE CONTROL MEASURES

Ventilation adequate to keep formaldehyde concentrations below indicated exposure limits should be provided.

PERSONAL PROTECTIVE EQUIPMENT

Have available and wear as appropriate: chemical splash goggles; full-length face shield/splash goggle combination; neoprene, nitrile, butyl, or polyvinyl gloves; coveralls with long sleeves. Selection and maintenance of personal protective equipment shall be in accordance with 29 CFR 1910.1048 (h). If exposure limits may be exceeded, the appropriate respirator as specified in Table I, 29 CFR 1910.1048 (g) should be used.

Wear self-contained breathing apparatus and full body protection for entry into areas where concentrations exceed 100 ppm, and for emergency reentry into areas of unknown concentrations.

DISPOSAL INFORMATION

AQUATIC TOXICITY

Formaldehyde: The 96-hour LC_{50} in fathead minnows is 38-48 mg/L.
Methanol: The 96-hour LC_{50} in fathead minnows is 28,100 mg/L.

SPILL, LEAK OR RELEASE

Wear self-contained breathing apparatus and full body protection. Soak up small spills with earth, sand, or other noncombustible absorbent material and remove in covered metal containers. Dike large spills and neutralize with dilute (5%) solutions of ammonia, sodium sulfite, or sodium bisulfite and remove. Flush area with plenty of water. Comply with Federal, State, and local regulations on reporting releases.

WASTE DISPOSAL

Cleaned up material is a RCRA hazardous waste. Comply with Federal, State, and local regulations.

SHIPPING INFORMATION

DOT (172.101) (F.P. = Flash Point)

	F.P.>141°F; <110 gal.	F.P.>141°F; >110 gal.	F.P.≤141°F; <110 gal.	F.P.≤141°F; >110 gal.
Shipping Name	RQ, Formaldehyde Solution	Formaldehyde Solution	RQ, Formaldehyde Solution	Formaldehyde Solution
Hazard Class	ORM-A	Combustible Liquid	ORM-A	Combustible Liquid
UN No.	2209	2209	1198	1198
DOT Placard	None	Combustible	None	Combustible

SHIPPING INFORMATION (cont'd)

DOT/IMO (172.102)

	F.P.>141°F (<110 gal.)	F.P. <141°F
Shipping Name	Formaldehyde Solution	Formaldehyde Solution
Hazard Class	ORM-A, 9	Flammable Liquid, 3.3
UN No.	2209	1198

REPORTABLE QUANTITY
Formaldehyde = 100 lb/45.4 kg

SHIPPING CONTAINERS
Tank cars, tank trucks, and samples.

ADDITIONAL INFORMATION AND REFERENCES

STORAGE CONDITIONS
Keep container closed. Keep away from heat and flame. Store in heated tank or warm room, above minimum storage temperature for grade handled.

NPCA-HMIS RATINGS

Health (Acute)	3
Flammability	2
Reactivity	0
Personal Protection	-

Personal Protection rating to be supplied by user depending on use conditions.

NFPA RATINGS

Health	2
Flammability	2
Reactivity	0
Unusual Hazards	-

SARA/TITLE III HAZARD CATEGORIES AND LISTS

Product Hazard Categories:

Chronic Health	- Yes
Acute Health	- Yes
Fire Hazard	- Yes
Pressure Hazard	- No
Reactivity Hazard	- No

Lists:

Extremely Hazardous Substance	- Yes
CERCLA Hazardous Substance	- Yes
Toxic Chemical	- Yes

CANADIAN WHMIS CLASSIFICATION
LM 37 grade: D-1A; D-1B; D-2A; D-2B; B-3

For further information, see Du Pont Formaldehyde Solutions Data Sheet and Formaldehyde Properties, Uses, Storage, and Handling Bulletin.

DATE OF LATEST REVISION/REVIEW: 2/90

PERSON RESPONSIBLE FOR MSDS:

W. J. BROCK
Du Pont
Chemicals and Pigments
Chestnut Run Plaza
P.O. Box 80709
Wilmington, DE 19880-0709
(302) 999-4946

CleanHarbors

Form No. LAS 7/89

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

CHI # 6933

PERMIT # _____

California List _____

HAZARD CODE D008

WASTE SOURCE BFI
WASTE GENERATOR BEST FOODS
WASTE DESCRIPTION PAINT CHIPS
RECEIPT DATE 3/8/91 VOLUME 6 DRUMS

WASTE CHARACTERISTICS

COLOR/APPEARANCE TAN / GREY WATER MISCIBILITY
% FLOATER % OIL ON ACIDIFICATION
% FREE OIL

TEST	As Rec.	LEACH.	TEST	As Rec.	LEACH.
pH	6.6	(10% soln)	Ag, ppm	0.40	
% TOTAL SOLIDS	89.3		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	4.3	
% SUSPENDED SOLIDS			Cd, ppm	12.6	0.1
% SETTLEABLE SOLIDS			Cr, ppm	54.8	<0.1
FLASH POINT °F	>212		Cr (Hex), ppm	—	
OIL AND GREASE, ppm			Cu, ppm	5.8	
PHENOLS, ppm	<1?		Hg, ppb	<3	
CHLORIDE, ppm			Ni, ppm	0.8	
BROMIDE, ppm			Pb, ppm	23,500	802
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.02	
COD, ppm			Zn, ppm	1.5	
BOD, ppm			Fe, ppm	59.8	
ACIDITY mg/1 as $CaCo_3$			Tl, ppm		
ALKALINITY, mg/1 as $CaCo_3$	1060		NH_3	ND	
CYANIDE, ppm (TOTAL)	<0.1		TOX, ppm		
CYANIDE, ppm (RELEASE)	<0.1		THOC, ppm		
SULFIDE, ppm (TOTAL)	2900		TOV, ppm		
SULFIDE, ppm (RELEASE)	0.29		PAINT FILTER	PASS - NO	FREE LIQ

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NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Bartlett Division
850 West Bartlett Road
Bartlett, IL 60103

Tel: (708) 289-3100
Fax: (708) 289-5445

ANALYTICAL REPORT

Mr. Jim Myczek
BROWNING-FERRIS IND.
8001 West 47th Street
Lyons IL 60534

02-12-91

Sample No.: 125552

Sample Description: 20595; Best Foods; Grab; Solid

Date/Time Received: 01-21-91 1530 Date Taken: 01-18-91 1500

Parameter	Results	Units	Matrix Spike % Recovery
TCLP - Cadmium	0.126*	mg/L	87.
TCLP - Chromium	0.021*	mg/L	85.
TCLP - Lead	746.*	mg/L	48.
TCLP VOLATILE COMPOUNDS			
Benzene	<20.	ug/L	105.
Carbon tetrachloride	<20.	ug/L	89.
Chlorobenzene	<20.	ug/L	100.
Chloroform	<20.	ug/L	92.
1,4-Dichlorobenzene	<20.	ug/L	99.
1,2-Dichloroethane	<20.	ug/L	95.
1,1-Dichloroethene	<20.	ug/L	97.
Tetrachloroethene	<20.	ug/L	100.
Trichloroethene	<20.	ug/L	97.
Vinyl chloride	<160.	ug/L	97.
Methyl ethyl ketone	<200.	ug/L	109.
TCLP BASE/NEUTRAL COMPOUND			
2,4-Dinitrotoluene	<100.	ug/L	10.
Hexachlorobenzene	<100.	ug/L	11.
Hexachlorobutadiene	<100.	ug/L	14.
Hexachloroethane	<100.	ug/L	16.
Nitrobenzene	<100.	ug/L	38.
Pyridine	<100.	ug/L	31.
TCLP ACID COMPOUNDS			
Pentachlorophenol	<500.	ug/L	87.
2,4,6-Trichlorophenol	<100.	ug/L	52.
2,4,5-Trichlorophenol	<500.	ug/L	80.
m-Cresol	<100.	ug/L	N/A
o-Cresol	<100.	ug/L	77.
p-Cresol	<100.	ug/L	81.

*Matrix spike correction factors have been applied to above results.

Neal Cleghorn
Project Manager

COPY

BULK [redacted]

Clean Harbors of Braintree Laboratory Bulk Shipping / Receiving Repo

SDF _____ DATE 5/24/91

ENERATOR Hazco Multiple Generators TRANSPORTER CWM

ANIFEST# 20 manifests per back TRANSPORTER# Ø

ORK ORDER# 59929 GALLONS 2660

ANIFEST DESCRIPTION Waste Flammable Liquid n.o.s., F003, F005

HYSICAL DESCRIPTION _____

ANALYSIS

PECIFIC GRAVITY	—	%CHLORINE	ND
H	7	BTU/GAL	excellent
I[redacted] POINT	170	% WATER	Ø
PCB	ND	CYANIDE	—
TOC	—	SOLUBILITY	floats
% SOLIDS	2%		

SUPPLEMENTAL ANALYSIS _____

CLHB CODE A21

SHIPPING CODE _____ ANALYST Victor

RESTRICTED FACILITIES _____ APPROVED BY _____

APPENDIX C-2

TREATABILITY STUDY DATA FOR OXIDATION OF ORGANIC COMPOUNDS

On-Site Treatment Methods

A. Primary Physical and Chemical Treatment

Primary treatment consists of chemical precipitation, coagulation, and filtration of inorganic-based, aqueous streams. The hazardous waste streams undergoing primary treatment are hazardous wastes because they typically exhibit one or more characteristics of a hazardous wastes. Treatment residuals (i.e., sludge) generated from the process is stabilized/fixated and shipped offsite as a non-hazardous waste. Treated effluent is discharged under permit to the publically owned treatment works (POTW) operated by the Metropolitan Water Reclamation District of Greater Chicago. The primary treatment process involves:

i. Chemical precipitation - Addition of solution of sodium hydroxide and sodium sulfide to precipitate any heavy metals present in the waste.

ii. Coagulation - Addition of certain ferric or aluminum salt solutions and polymers to affect the coagulation and flocculation of the precipitated heavy metals.

iii. Filtration - Physical separation of the solids from the liquids in the treated waste using plate and frame filter presses.

iv. Stabilization/fixation - Addition of inert solids and lime to affect stabilization and fixation of appropriate waste streams with de-watering.

The list of hazardous waste codes accepted for storage and primary treatment is presented in Table C-1. These codes may be accepted in bulk tanker, container (e.g. 55-gallon drum), or lab pack form.

The boundary conditions for acceptance and treatment of each waste or waste group is noted on Table C-1. The boundary condition represents the maximum value of the waste characteristic which the facility can properly treat. The rationale for listing of this maximum value is based on: 1) analysis and treatability testing of several thousand waste samples submitted to Clean Harbors facilities by numerous generators; 2) volatile organic testing for various components of composite streams prior to and following normal treatment; 3) review of US EPA Treatability Manual published in 1980 (EPA 600/8-80-042a)-(EPA 600/8-80-42e); review of "Chemical Treatability Summary", a reference on the treatability of 505 different chemical compounds published by Touhill, Shuckrow and Associates, Inc.; and/or 5) review of numerous technical articles and books related to aqueous waste treatment.

B. Specialized Pretreatment Prior to Primary Treatment

Certain incoming waste streams require pretreatment such as neutralization, oxidation, reduction, or oil recovery prior to performing primary treatment. Pretreatment schemes include:

a. Neutralization - Addition of alkaline material to neutralize highly acidic materials or addition of acid to neutralize highly alkaline materials. The list of hazardous waste codes requiring pretreatment using neutralization is presented in Table C-2.

b. Chemical oxidation - Utilization of oxidizing agents such as hydrogen peroxide, potassium permanganate, or similar agents, to treat oxidizable materials in order to render them suitable for further treatment. The list of hazardous waste codes requiring pretreatment using chemical oxidation is presented in Table C-3.

c. Chemical reduction - Treatment of hexavalent chromium containing waste in an acidic medium with sodium bisulfate to obtain the precipitable trivalent form. The list of hazardous waste codes requiring pretreatment using chemical reduction is presented in Table C-4.

d. Other pretreatment methods - Includes ammonia stripping, chelation breaking, and organic stripping. The list of hazardous waste codes requiring pretreatment using these pretreatment methods is presented in Table C-5.

e. Oil Recovery - Separation of oil from the aqueous material in a waste through heat, demulsifying agents, and pH adjustment to an acidic condition. The list of waste requiring pretreatment using oil recovery techniques is presented in Table C-6.

Waste sreams undergoing pretreatment may be accepted in bulk tanker, container (e.g. 55-gallon drum), or lab pack form. The waste stream boundary condition listed in Tables C-2 through C-6 represent the the maximum value of the waste characteristic or constituent which the facility can properly treat. The rationale for listing of this maximum value is based on: 1) analysis and treatability testing of several thousand waste samples submitted to Clean Harbors facilities by numerous generators; 2) volatile organic testing for various components of composite streams prior to and following normal treatment; 3) review of US EPA Treatability Manual published in 1980 (EPA 600/8-80-042a)-(EPA 600/8-80-42e); review of "Chemical Treatability Summary", a reference on the treatability of 505 different chemical compounds published by Touhill, Shuckrow and Associates, Inc.; and/or 5) review of numerous technical articles and books related to aqueous waste treatment.

wastewaters.

Expected Copper Removals (Theoretical and bench test basis):

Hydroxide Precipitation	93-99+%
Sulfide Precipitation	95-99+%
Coprecipitation with ferrous sulfate	90-99%

Iron

Limitation 200,000ppm

The standard treatment method for iron is conversion of the ferrous ion the ferric state, and precipitation of ferric hydroxide. Conversion of ferrous to ferric iron occurs rapidly upon aeration at pH 7.0 to 7.5. Precipitation of ferric hydroxide occurs upon addition of lime or sodium hydroxide. Coagulant aids will increase the efficiency of iron removal. Iron wastes which require pretreatment will be dewatered with the filtrate retreated either through the chemical treatment unit or in the reactor. Double pretreatment may be required for highly concentrated iron wastewaters.

Expected Iron Removals (Theoretical and bench test basis):

Hydroxide Precipitation (After Ferric Conversion)	93-99+%

Lead

Limitation 150,000ppm

Lead is normally precipitated as a hydroxide or a carbonate. Lime or sodium hydroxide addition will result in hydroxide precipitation. Carbonate addition, such as calcium carbonate will precipitate lead carbonate which is normally more insoluble than lead hydroxide. Theoretical solubility calculations indicate the most efficient lead hydroxide precipitation occurs at pH near 10. Precipitation can be assisted by the addition of ferrous sulfate, which acts as a coagulating agent. Ferris or sodium sulfide can also increase precipitation. Alum coagulation also increases leac removal. Lead wastes which require pretreatment will be dewaterec with the filtrate retreated either through the chemical treatment unit or in the reactor. Double pretreatment may be required for highly concentrated lead wastewaters.

Expected Lead Removals (Theoretical and bench test basis):

Hydroxide Precipitation	90-99%
Carbonate Precipitation	95-99+%
Precipitation/Coagulation	95-99+%
Sulfide Precipitation	93-99%

Nickel

Limitation 150,000ppm

Nickel is normally precipitated upon addition of lime or sodium hydroxide to insoluble nickel hydroxide. Additional carbonate or sulfide precipitation can yield lower effluent nickel levels. Organosulfide treatment after hydroxide precipitation has

Limitations are based on wastestream concentrations observed in this market, treatability studies of actual wastestreams, and theoretical expectations. Materials with high metal concentrations which can be accepted for storage and transfer, will be sent for recovery whenever possible. Recovery is not always practical due to contamination from other metals. Waste treatment through the chemical treatment unit involves hydroxide precipitation with lime or sodium hydroxide, coagulation with aluminum sulfate, precipitation with sodium sulfide, and flocculation with polymers. Wastestreams with high metal concentrations will be appropriately pretreated. All sludge resideu produced from wastewater treatment will be below the toxicity characteristics for hazardous waste.

Arsenic

Limitation 10,000ppm

Arsenic is commonly precipitated upon addition of lime or sulfide. Arsenic in industrial wastes which also contain heavy metals in solution can be concurrently coprecipitated upon precipitation of the heavy metals. Coprecipitation involves both adsorption of the soluble ion onto another bulk-precipitated solid and coagulation with the bulk precipitate. If arsenic is present as arsenite, effective treatment may require oxidation to arsenate by potassium permanganate addition prior to coprecipitation. Arsenic wastes which require pretreatment will be dewatered with the filtrate retreated through the chemical treatment unit. A combination of treatment methods may be required for effective treatment.

Expected Arsenic Removals (Theoretical and bench test basis):

Sulfide Precipitation	80-99+%
Lime Precipitation	73-95%
Coprecipitation with alum	85-99+%
Coprecipitation with ferric chloride	81-99+%
Coprecipitation with ferric sulfate	80-99+%

Barium

Limitation 10,000ppm

Barium is commonly precipitated as barium carbonate upon pH adjustment with lime to 10.5 pH. Barium is also precipitated as barium sulfate with addition of aluminum sulfate, sodium sulfate, or ferric sulfate. pH adjustmnent to 10.0 pH should yield the lowest solubility. Barium wastes which require pretreatment will be dewatered with the filtrate retreated through the chemical treatment unit. A combination of treatment methods may be required for effective treatment.

Expected Barium Removals (Theoretical and bench test basis):

Carbonate Precipitation	90-98%
Sulfate Precipitation	93-99+%
Hydroxide Precipitation	80-90%

Cadmium

Limitation 10,000ppm

Cadmium is commonly precipitated as cadmium hydroxide upon addition of lime or sodium hydroxide with minimum solubility at pH 10. With addition of supplemental carbonate (soda ash, sodium barcarbonate, calcium carbonate), cadmium carbonate (much less insoluble than cadmium hydroxide) is precipitated. Sulfide precipitation with sodium sulfide after addition of lime has benefits mainly in the instance of concentrated cadmium wastewaters. Coprecipitation with, or adsorption with iron or aluminum hydroxide is also effective. Cadmium wastes which require pretreatment will be dewatered with the filtrate retreated through the chemical treatmenbt unit. A combination of treatment methods may be required for effective treatment.

Expected Cadmium Removals (Theoretical and bench test basis):

Hydroxide Precipitation	90-98%
Carbonate Precipitation	97-99+%
Lime Plus Sulfide Precipitation	93-99+%
Iron/Alum Coprecipitation	95-99+%

Chromium

Limitation 250,000ppm

Trivalent chromium can be removed as insoluble chromium hydroxide by precipitation with sodium hydroxide or lime. Efficient removal may require a coagulant aid. Hexavalent chromium must be reduced to trivalent chromium prior to precipitation. The standard reduction technique is to lower the wastestream to a pH of 1.5 to 3.0 with sulfuric acid and addition of a chemical reducing agent such as sodium bisulfite or metabisulfite. Chromium wastes which require pretreatment will be dewatered with the filtrate retreated either through the chemical treatment unit or in the reactor. Double pretreatment may be required for highly concentrated chromium wastewaters.

Expected Chromium Removals (Theoretical and bench test basis):

Hydroxide Precipitation (After Hexavalent Reduction)	95-99+%

Copper

Limitation 150,000ppm

The standard treatment method for copper is precipitation as the relatively insoluble hydroxide upon addition of lime or sodium hydroxide. Precipitation of the sulfide occurs upon addition of sodium sulfide. Coprecipitation by addition of ferrous sulfate is necessary for strongly complexed copper wastewaters. Removal of complexing agents such as ammonia are essential for4 good copper treatment. Ammonia will be removed by elevated pH and air stripping prior to precipitation. Copper wastes which require pretreatment will be dewatered with the filtrate retreated either through the chemical treatment unit or in the reactor. Double pretreatment may be required for highly concentrated copper

reduced nickel levels further. Wastes complexed with ammonia must be pretreated for ammonia removal for effective treatment. pH adjustments and air-stripping will be necessary for ammonia removal. Nickel wastes which require pretreatment will be dewatered with the filtrate retreated either through the chemical treatment unit or in the reactor. Double pretreatment may be required for highly concentrated nickel wastwaters.

Expected Nickel Removals (Theoretical and bench tests):

Hydroxide Precipitation	85-95%
Hydroxide/Sulfide Precipitation	90-98%
Hydroxide/Organosulfide Precipitation	90-99%

<u>Selenium</u>

Limitation 10,000ppm

Selenium precipitation is accomplished through aluminum sulfate coagulation/coprecipitation and iron coagulation/ coprecipitation. Selenium wastes which require pretreatment will be dewatered with the filtrate retreated either through the chemical treatment unit or in the reactor. Double pretreatment may be required for highly concentrated selenium wastewaters.

Expected Selenium Removals (Theoretical and bench test basis):

Alum Coagulation/Coprecipitation	80-85%
Iron Coagulation/Coprecipitation	80-85%

<u>Silver</u>

Limitation 10,000ppm

Silver is normally precipitated as hydroxide by addition of lime. Precipitation can also be accomplished by addition of a coagulant/coprecipitant such as ferric chloride. Precipitation from sodium sulfide addition forms extremely insoluble silver sulfide. Silver wastes which require pretreatment will be dewatered with the filtrate retreated through the chemical treatment unit. A combination of treatment methods may be required for effective treatment.

Expected Silver Removals (Theoretical and bench test basis):

Hydroxide Precipitation	92-98%
Coagulant/Coprecipitant	90-97%
Sulfide Precipitation	95-99%

<u>Zinc</u>

Limitation 180,000ppm

Zinc solubilty patterns correspond to the classic u-shaped meta hydroxide solubility curves, optimum treatment pH 9.0 - 9.8. Zinc in normally precipitated by lime or sodium hydroxide addition, clarification, and filtration. Second-stage sulfide precipitation/filtration will yield higher removal efficiencies. Zinc wastes which require pretreatment will be dewatered with the filtrate retreated either through the chemical treatment unit or in the reactor. Double pretreatment may be required for highly

concentrated zinc wastewaters.

Expected Zinc Removals (Theoretical and bench test basis):

Hydroxide Precipitation	95-98%
Hydroxide/Sulfide Precipitation	97-99+%

6544

10-12-90

PERMIT # Supp

HAZ CODES D030, D032, D033, D034

Clean Harbors

ENVIRONMENTAL SERVICES COMPANIES
11900 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS

OK ___ ACCEPT ✓ REJECT

PRICE

QUOTE

WASTE SOURCE

WASTE GENERATOR Hille Die Casting

WASTE DESCRIPTION Die Casting Operation

RECEIPT DATE

VOLUME 300 gal/gpc

WASTE CHARACTERISTICS

COLOR, APPEARANCE Brown-thin

WATER MISCIBILITY Bottom +

% FLOATER +

% OIL ON ACIDIFICATION Oil Skum

% FREE OIL 25

TEST	As Rec	LEACH	TEST	As Rec.	TCLP
PH	6.7		Ag ppm	0.1	
% TOTAL SOLIDS	2.4J		As ppm	<0.1	
% DISSOLVED SOLIDS			Ba ppm	0.66	
% SUSPENDED SOLIDS	<0.1		Cd ppm	0.1	
% SETTLEABLE SOLIDS			Cr ppm	1.1	
FLASH POINT °C	>210°F		Cr (Hex) ppm	ND	
OIL AND GREASE ppm	720		Cu ppm	3.3	
PHENOLS ppm	2.5		Hg ppb	<3.0	
CHLORIDE ppm			Ni ppm	<0.1	
BROMIDE ppm			Pb ppm	1.1	
PHOSPHATE ppm (TOTAL)			Se ppm	<0.1	
COD ppm	128,000		Zn ppm	10.8	
BOD ppm			Fe ppm	39.4	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$				<0.1	
CYANIDE ppm (TOTAL)				ND	
CYANIDE ppm (RELEASE)	<1.0				
SULFIDE ppm (TOTAL)					
SULFIDE ppm µL	40			60,000	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 35 mls 0.1 N NaOH: 10 mls Sample

TREATMENT WITH MIX TANK 5 - WASTE + 95 ml MIX TANK

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	47	43	IRON ppm	7.60	7.6
% SOLIDS Produced by Weight	32.1	33.6	NICKEL, ppm	4.63	4.9
COD, ppm	16,800	22,400	ZINC, ppm	7.60	5.1
CYANIDE (TOTAL), ppm			O&G ppm		
CYANIDE (RELEASABLE), ppm			COPPER ppm	0.14	0.1
BORON ppm			LEAD, ppm	0.17	0.2
CADMIUM ppm	0.1	0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	20.6	12.8	ppm		
CHROMIUM (HEX), ppm					

ACCEPTED

REJECTED

COMMENTS Pretreat: Oxydation w/ $KMnO_4$:

TCLP	ppm
2,4-Dinitrotoluene	<0.03
Hexachlorobenzene	<0.13
Hexachlorobutadiene	<0.5
Hexachloroethane	<3.0

California

Yes ___ N

Please C

Sent for

SEP 24 '90 04:14 CEC

ENVIRONMENTAL SERVICES

CHEMCO CORPORATION
140 EAST RYAN ROAD OAK CREEK, WI 53154-4599 (414) 764-7008

09/21/90 LABORATORY REPORT PAGE 1

A021 8453036

ACME DIE CASTING CORPORATION
5656 21ST STREET P.O. BOX 1705
RACINE ,WI 53401
ATTN: JAMES GREGERSEN

SAMPLE 90205-A00881 WASTEWATER
DATE COLLECTED 07/20/90 DATE RECEIVED 07/24/90

TEST NAME	RESULT	UNITS	EP RESULT	TCLP RESULT		LIMIT
ODOR	MODERATE					
LAYERS	NONE					
PHYSICAL STATE	LIQUID	MG/L				
CARBON TETRACHLORIDE-TCLP				<0.20	MG/L	0.5
CHLOROFORM-TCLP				<0.20	MG/L	6.0
1,2 DICHLOROETHANE-TCLP				<0.20	MG/L	0.5
1,1 DICHLOROETHYLENE-TCLP				<0.20	MG/L	0.7
TETRACHLOROETHYLENE-TCLP				<0.20	MG/L	0.7
VINYL CHLORIDE-TCLP				<0.20	MG/L	0.2
TRICHLOROETHYLENE-TCLP				<0.20	MG/L	0.5
O-CRESOL-TCLP				<0.10	MG/L	200.0
M-CRESOL-TCLP				<0.10	MG/L	200.0
P-CRESOL-TCLP				<0.10	MG/L	200.0
METHYL ETHYL KETONE-TCLP				<0.10	MG/L	200.0
PYRIDINE-TCLP				<0.10	MG/L	5.0
BENZENE-TCLP				<0.10	MG/L	0.5
CHLOROBENZENE-TCLP				<0.10	MG/L	100.0
HEXACHLOROETHANE-TCLP				3.7	MG/L	3.0
1,4-DICHLOROBENZENE-TCLP				0.67	MG/L	7.5
2,4-DINITROTOLUENE-TCLP				1.6	MG/L	0.13
HEXACHLOROBENZENE-TCLP				0.99	MG/L	0.13
HEXACHLOROBUTADIENE-TCLP				6.2	MG/L	0.5
NITROBENZENE-TCLP				0.81	MG/L	2.0
2,4,5-TRICHLOROPHENOL-TCLP				<0.25	MG/L	400.0
PENTACHLOROPHENOL-TCLP				<0.25	MG/L	100.0
2,4,6-TRICHLOROPHENOL-TCLP				<0.25	MG/L	2.0
CADMIUM - TOTAL	<0.10	MG/L				
CHROMIUM - TOTAL	3.2	MG/L				
COPPER - TOTAL	38	MG/L				
LEAD - TOTAL	7.4	MG/L				
NICKEL - TOTAL	2.1	MG/L				

PLEASE CONTACT CLIENT SERVICES WITH ANY QUESTIONS. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT ; NON-WATER SAMPLES WILL BE RETURNED 6 WEEKS AFTER RECEIPT. N/T = NOT TESTED, N/A = NOT APPLICABLE.
@ = ELEVATED DETECTION LIMIT DUE TO MATRIX INTERFERENCE. # = ELEVATED DETECTION LIMIT DUE TO SAMPLE CONCENTRAT.
$ = ELEVATED DETECTION LIMIT DUE TO SAMPLE VOLUME.

IL EPA CERTIFICATION # 100243; AIHA ACCREDITED. APPROVAL

CH. # 9106

LOG IN 3-5-91

PERMIT #

HAZ CODES D040

Clean Harbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS

OK ___ ACCEPT ✓ REJEC

PRICE

QUOTE

WASTE SOURCE

WASTE GENERATOR Nevco, Inc

WASTE DESCRIPTION Aluminum Hydroxide Slurry

RECEIPT DATE VOLUME 10-20,000 gal/mo

WASTE CHARACTERISTICS

COLOR/APPEARANCE Tan - WATER MISCIBILITY +

% FLOATER — % OIL ON ACIDIFICATION —

% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
PH	3.7		Ag, ppm	0.38	
% TOTAL SOLIDS	16.32		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	0.18	
% SUSPENDED SOLIDS	6.02		Cd, ppm	0.20	
% SETTLEABLE SOLIDS			Cr, ppm	0.70	
FLASH POINT °C	>140°F		Cr (Hex), ppm	ND	
OIL AND GREASE, ppm	60		Cu, ppm	1.78	
PHENOLS, ppm	<0.5		Hg, ppb	<1.0	
CHLORIDE, ppm			Ni, ppm	2.44	
BROMIDE, ppm			Pb, ppm	1.78	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	5200		Zn, ppm	5.60	
BOD, ppm			Fe, ppm	5.46	
ACIDITY mg·l as $CaCo_3$					
ALKALINITY mg/l as $CaCo_3$			Tl ppm	2.50	
CYANIDE, ppm (TOTAL)	21.0		NH	ND	
CYANIDE, ppm (RELEASE)					
SULFIDE, ppm (TOTAL)			TOX, ppm		
SULFIDE, ppm Rel	<10		TOC, ppm	1600.0	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 15 ml 0.1 N NaOH

TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX Sam
% SOLIDS Produced by Volume	75	74	IRON, ppm	2.85	2.[illegible]
% SOLIDS Produced by Weight	4.77	4.94	NICKEL, ppm	4.42	3.[illegible]
COD, ppm	18,000	16,000	ZINC, ppm	0.44	0.4
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.14	0.[illegible]
BORON ppm			LEAD, ppm	0.38	0.2
CADMIUM, ppm	0.1	0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	3.11	2.55	Tl ppm		
CHROMIUM (HEX), ppm					

ACCEPTED: [illegible] REJECTED:

COMMENTS Pretreat Trichloroethylene = $KMnO_4$ Oxidation = <0.10 ppm

California L

Yes ___ No

Please Che

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pace INCORPORATED
THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Neville Chemical Co.
Analysis of Various Solid Waste Samples

Sample #	Aluminum Hydroxide
PACE Sample #	50414
Pesticides/Herbicides	(µg/L)
Endrin	<2.0
Lindane	<2.0
Methoxychlor	<2.0
Toxaphene	<2.0
2,4-D	<2,000
2,4,5-TP (Silvex)	<200
Chlordane	<2.0
Heptachlor	<2.0

Zero Head Extraction

Volatiles	(µg/L)
Benzene	<250
Carbon tetrachloride	<250
Chlorobenzene	8,200
Chloroform	<250
1,2-Dichloroethane	<250
1,1-Dichloroethene	<250
Methyl ethyl ketone	<500
Tetrachloroethene	<250
Vinyl chloride	<500
Trichloroethylene	33,000

David A. Danner
Analytical Services Division Director

100 Marshall Drive
Warrendale, PA 15086
TEL: 412-772-1216

Offices Serving: Minneapolis, Minnesota; Tampa, Florida; Iowa City, Iowa; Los Angeles, California; Charlotte, North Carolina; Asheville, North Carolina; New York, New York; All State Government Laboratories

CHI # 9174
LOG IN 3-19-91
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CleanHarbors
ENVIRONMENTAL SERVICES COMPANIES
11900 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS
OK ACCEPT ✓
PRICE
QUOTE

WASTE SOURCE
WASTE GENERATOR Arsenic Industries
WASTE DESCRIPTION Rain Water Collection
RECEIPT DATE VOLUME 27,000/yr

WASTE CHARACTERISTICS

COLOR/APPEARANCE Opaque/Thin
WATER MISCIBILITY +
% FLOATER <0.5%
% OIL ON ACIDIFICATION —
% FREE OIL + <0.5%

TEST	As Rec	LEACH	TEST	As Rec.
PH	5.7		Ag, ppm	<0.1
% TOTAL SOLIDS	0.03		As, ppm	<0.1
% DISSOLVED SOLIDS			Ba, ppm	0.50
% SUSPENDED SOLIDS	0.03		Cd, ppm	<0.1
% SETTLEABLE SOLIDS			Cr, ppm	0.3
FLASH POINT °C	>200°F		Cr (Hex), ppm	ND
OIL AND GREASE ppm	856		Cu, ppm	<0.1
PHENOLS ppm	<0.5		Hg, ppb	<1.0
CHLORIDE, ppm			Ni, ppm	<0.1
BROMIDE, ppm			Pb, ppm	1.5
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1
COD ppm	6000		Zn, ppm	0.40
BOD ppm			Fe ppm	7.5
ACIDITY mg/l as $CaCO_3$				
ALKALINITY, mg/l as $CaCO_3$			Ti ppm	<0.1
CYANIDE, ppm (TOTAL)			NH_3	ND
CYANIDE, ppm (RELEASE)	<1.0			
SULFIDE, ppm (TOTAL)			TOX ppm	
SULFIDE ppm rel	<10		TOC ppm	2800

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 0.4 mls 0.1 N NaOH: 10 mls Sample
TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK
% SOLIDS Produced by Volume	80	80	IRON, ppm	2.00
% SOLIDS Produced by Weight	5.01	4.43	NICKEL, ppm	4.24
COD ppm	13,600	15,200	ZINC, ppm	0.37
CYANIDE (TOTAL), ppm			O&G, ppm	
CYANIDE (RELEASABLE), ppm			COPPER ppm	0.30
BORON ppm			LEAD, ppm	0.30
CADMIUM, ppm	<0.1	<0.1	MERCURY, ppb	
CHROMIUM (TOTAL), ppm	0.61	0.64	Ti ppm	
CHROMIUM (HEX), ppm				

ACCEPTED Cody Rubin / Ass Lab Manager REJECTED:

COMMENTS Pretreat Trichloroethylene; $KMnO_4$ Oxidation = <0.05 ppm

Califor
Yes
Please
Sent f

CHI # 44216

LOG IN 12-12-90

PERMIT #

HAZ CODES D036

Clean Harbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS 1-14-

OK ___ ACCEPT ✓ REJ

PRICE

QUOTE

WASTE SOURCE

WASTE GENERATOR Chemy Electric

WASTE DESCRIPTION Resist Stripper

RECEIPT DATE

VOLUME 45,000 gal/gal

WASTE CHARACTERISTICS

COLOR/APPEARANCE Burgundy - Thin

WATER MISCIBILITY +

% FLOATER —

% OIL ON ACIDIFICATION —

% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	TC
PH	10.2		Ag, ppm	0.44	
% TOTAL SOLIDS	1.74		As, ppm	40.1	
% DISSOLVED SOLIDS			Ba, ppm	0.24	
% SUSPENDED SOLIDS	40.1		Cd, ppm	40.1	
% SETTLEABLE SOLIDS			Cr, ppm	2.92	
FLASH POINT °C	>140°F		Cr (Hex), ppm	ND	
OIL AND GREASE, ppm	711		Cu, ppm	460	
PHENOLS ppm	7.5		Hg, ppb	<3.0	
CHLORIDE, ppm			Ni, ppm	40.1	
BROMIDE, ppm			Pb, ppm	4.7	
PHOSPHATE, ppm (TOTAL)			Se, ppm	40.1	
COD, ppm	<800		Zn, ppm	8.0	
BOD, ppm			Fe, ppm	2.64	
ACIDITY mg/l as $CaCo_3$					
ALKALINITY, mg/l as $CaCo_3$			Tl ppm	0.50	
CYANIDE, ppm (TOTAL)			NH_3	400	
CYANIDE, ppm (RELEASE)	<1.0				
SULFIDE, ppm (TOTAL)			TOX, ppm		
SULFIDE ppm rel	<10		TOC ppm	25,000	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 2.8 mls 0.1 N H_2SO_4 : 10 mls sample

TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MI Sam
% SOLIDS Produced by Volume	94	92	IRON, ppm	6.8	3.
% SOLIDS Produced by Weight	6.56	5.85	NICKEL, ppm	7.2	5
COD, ppm	16,000	29,600	ZINC, ppm	0.40	0.
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.23	0.
BORON ppm			LEAD, ppm	0.46	0.
CADMIUM, ppm	0.1	0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	1.19	1.26	Tl ppm		
CHROMIUM (HEX), ppm					

ACCEPTED Contract Rotary Vacuum Stripper

REJECTED:

COMMENTS Pretreat nitrobenzene - H_2O_2 + $KMnO_4$ = <1.0 ppm

California

Yes ___ No

Please Ch

Sent for C

TENCO ENVIRONMENTAL LABORATORIES

1150 Junction Avenue - Schererville, Indiana 46375
1-219-322-2560 • 1-800-428-3311
Fax 1-219-322-0440

REPORT TO:
:ebecca Etnire
'ET Environmental Inc
.50 Sumac Road
'heeling, IL 60090

Date: 2/19/91
Recd: 2/4/91
WO #: 22-4149

Cherry Electric Products Corp

Laboratory Smp ID No.:	AA23694						
DESCRIPTION: —> :ess otherwise noted; ilts in parts per :ion - ppm) PARAMETERS:	Filmstrip 11419-670-06				Detection Limits	Regulatory Level (mg/L)	EPA HW Number
II-VOLATILES-TCLP ORGANICS*							
:resol, total	9.98				0.002 ppm	200.0	D026
.4-Dichlorobenzene	ND				0.002 ppm	7.5	D027
:.4-Dinitrotoluene	ND				0.002 ppm	0.13	D030
Hexachlorobenzene	ND				0.002 ppm	0.13	D032
Hexachlorobutadiene	ND				0.002 ppm	0.5	D033
Hexachlorethane	ND				0.002 ppm	3.0	D034
Nitrobenzene	11.19				0.002 ppm	2.0	D036
Pentachlorophenol	ND				0.002 ppm	100.0	D037
Pyridine	ND				0.002 ppm	5.0	D038
2,4,5-Trichlorophenol	ND				0.002 ppm	400.0	D041
2,4,6-Trichlorophenol	ND				0.002 ppm	2.0	D042

TENCO ENVIRONMENTAL LABORATORIES

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1-219-322-2560 • 1-800-428-3311
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REPORT TO:
ebecca Etnire
ET Environmental Inc
50 Sumac Road
heeling, IL 60090

Date: 2/19/91
Recd: 2/4/91
WO #: 22-4149

Cherry Electric Products Corp

Laboratory Smp ID No.:	AA23684						
DESCRIPTION: —> ess otherwise noted; lts in parts per ion - ppm] PARAMETERS:	Filmstrip 11419-670-06				Detection Limits	Regulatory Level (mg/L)	EPA HW Number
ATILES-ZHE ORGANICS*							
zene	ND				0.002 ppm	0.5	D018
bon Tetrachloride	ND				0.002 ppm	0.5	D019
orobenzene	ND				0.002 ppm	100.0	D021
oroform	0.015				0.002 ppm	6.0	D022
-Dichloroethane	ND				0.002 ppm	0.5	D028
-Dichloroethylene	ND				0.002 ppm	0.7	D029
hyl Ethyl Ketone	ND				0.002 ppm	200.0	D035
rachloroethylene	ND				0.002 ppm	0.7	D039
chloroethylene	ND				0.002 ppm	0.5	D040
yl Chloride	ND				0.002 ppm	0.2	D043

CH... 7874
LOG N 11-12-90
PERM...
HAZ CODES D035, D002, D007, D006

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS
OK ___ ACCEPT ✓ REJECT
PRICE
QUOTE

WASTE SOURCE Pretreat Analysis Available - Ask Mike
WASTE GENERATOR BC Aviation
WASTE DESCRIPTION Alodine Etch Solution
RECEIPT DATE VOLUME 15,000

WASTE CHARACTERISTICS

COLOR/APPEARANCE Green - Thin
WATER MISCIBILITY +
% FLOATER no
% OIL ON ACIDIFICATION —
% FREE OIL no

TEST	As Rec	LEACH	TEST	As Rec.	TCLP
PH	2.0		Ag ppm	<0.1	
% TOTAL SOLIDS	3.78		As ppm	<0.1	
% DISSOLVED SOLIDS			Ba ppm	<0.1	
% SUSPENDED SOLIDS	<0.1		Cd ppm	<0.1	
% SETTLEABLE SOLIDS			Cr ppm	872	130
FLASH POINT °C	<200°F		Cr (Hex) ppm	ND	
OIL AND GREASE ppm	<1.0		Cu ppm	0.78	
PHENOLS ppm			Hg ppb	<3.0	
CHLORIDE ppm			Ni ppm	0.30	
BROMIDE ppm			Pb ppm	0.34	
PHOSPHATE ppm (TOTAL)			Se ppm	<0.1	
COD ppm	<800		Zn ppm	0.50	
BOD ppm			Fe ppm		
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			[illegible] ppm	0.44	
CYANIDE ppm (TOTAL)	<1.0		[illegible]	ND	
CYANIDE ppm (RELEASE)					
SULFIDE ppm (TOTAL)	<1.0		[illegible] ppm		
SULFIDE ppm			[illegible] ppm	1100	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 50.0 mls 0.1 N NaOH: 10 mls sample
TREATMENT WITH MIX TANK 10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	70	70	IRON, ppm	1.66	1.5
% SOLIDS Produced by Weight	3.0	2.9	NICKEL, ppm	2.4	2.[illegible]
COD, ppm	18,000	18,800	ZINC, ppm	0.18	0.1
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE) ppm			COPPER ppm	1.4	1.0
BORON ppm			LEAD, ppm	0.33	0.3
CADMIUM ppm	<0.1	<0.1	MERCURY ppb		
CHROMIUM (TOTAL), ppm	0.12	0.12	Ti ppm		
CHROMIUM (HEX), ppm					

ACCEPTED [signature] / [signature] REJECTED

COMMENTS Pretreat — MEK Oxydation - $FeSO_4$ + H_2O_2
MEK = <200.0 ppm

California Li...
Yes ___ No ...
Please Chec...
Sent for G...

TEST RESULTS BY SAMPLE

Sample: 01A EK6332 ALODINE ETCH Collected: 10/04/90
Job: TCLP_I TCLP Inorganic

Test Description	Result	Limit	Units	Ana
TCLP (Arsenic)	0.06	5.0	mg/l	10/
TCLP (Barium)	0.61	100.0	mg/l	10/
TCLP (Cadmium)	* 2.6	1.0	mg/l	10/
TCLP (Chromium)	** 130	5.0	mg/l	10/
TCLP (Copper)	0.89	100	mg/l	10/
TCLP (Lead)	0.5	5.0	mg/l	10/
TCLP (Mercury)	< 0.001	0.2	mg/l	10/
TCLP (Nickel)	0.17	35	mg/l	10/
TCLP (Selenium)	< 0.010	1.0	mg/l	10/
TCLP (Silver)	< 0.05	5.0	mg/l	10/
TCLP (Zinc)	4.1	200	mg/l	10/
TCLP Inorganic Extraction	-		-	10/

Sample: 01B EK6332 ALODINE ETCH Collected: 10/04/90
Job: TCLP_O TCLP Organic

Test Description		Result	Limit	Units	Anal
8240 TCLP					
Benzene	*	< 500	500	ppb	11/1
Methyl Ethyl Ketone	*	390000	200000	ppb	11/1
Carbon tetrachloride	*	< 500	500	ppb	11/1
Chlorobenzene	*	< 500	100000	ppb	11/1
Chloroform	*	< 500	6000	ppb	11/1
1,2-Dichloroethane	*	< 500	500	ppb	11/1
1,4-Dichlorbenzene	*	< 1000	7500	ppb	11/1
1,1-Dichloroethene	*	< 500	700	ppb	11/1
Tetrachloroethene	*	< 500	700	ppb	11/1
Trichloroethene	*	< 500	500	ppb	11/1
Pyridine	*	<5000	5000	ppb	11/1
Vinyl Chloride	*	< 1000	200	ppb	11/1
8270 TCLP					
2,4-Dinitrotoluene		< 10	130	ppb	11/0
Hexachlorobenzene		< 10	130	ppb	11/0
Hexachloro-1,3-butadiene		< 10	500	ppb	11/0
Hexachloroethane		< 10	3000	ppb	11/0
Cresol (Total)		< 10	200000	ppb	11/0
Nitrobenzene		< 10	2000	ppb	11/0
Pentachlorophenol		< 50	100000	ppb	11/0
2,4,5-Trichlorophenol		< 10	400000	ppb	11/0
2,4,6-Trichlorophenol		< 10	2000	ppb	11/0
TCLP ZHE VOC Extraction		-		-	11/0

CHI # 8244

LOG IN 8-21-90

PERMIT #

HAZ CODES D029

Clean Harbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS

OK ___ ACCEPT ✓ REJEC

PRICE

QUOTE

WASTE SOURCE Sludge Removal.

WASTE GENERATOR Transport Service

WASTE DESCRIPTION Tank Cleaning

RECEIPT DATE

VOLUME 50 K gal.

WASTE CHARACTERISTICS

COLOR/APPEARANCE Grey-Heavy Solids

WATER MISCIBILITY +

% FLOATER —

% OIL ON ACIDIFICATION —

% FREE OIL —

TEST	As Rec.	LEACH.	TEST	As Rec.	TCLI
PH	6.6		Ag. ppm	0.22	
% TOTAL SOLIDS	0.53		As. ppm	0.1	
% DISSOLVED SOLIDS			Ba. ppm	0.82	
% SUSPENDED SOLIDS	0.30		Cd. ppm	0.2	
% SETTLEABLE SOLIDS			Cr. ppm	0.62	
FLASH POINT °C	>140°F		Cr (Hex). ppm	ND	
OIL AND GREASE. ppm	435		Cu. ppm	0.84	
PHENOLS. ppm	11.0		Hg. ppb	<3.0	
CHLORIDE. ppm			Ni. ppm	0.30	
BROMIDE. ppm			Pb. ppm	0.33	
PHOSPHATE. ppm (TOTAL)			Se. ppm	40.7	
COD ppm	3200		Zn. ppm	1.4	
BOD ppm			Fe. ppm	32.4	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY. mg/l as $CaCO_3$			Tl. ppm	<0.1	
CYANIDE. ppm (TOTAL)			NH_3		
CYANIDE. ppm (RELEASE)	<1.0				
SULFIDE. ppm (TOTAL)			TOX. ppm		
SULFIDE. ppm Sil	<10		TOC. ppm	4400	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 0.8 mls 0.1 N NaOH

TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX Sam
% SOLIDS Produced by Volume	43	39	IRON. ppm	1.46	0.
% SOLIDS Produced by Weight	2.67	2.66	NICKEL. ppm	1.25	1.
COD. ppm	12,000	12,600	ZINC. ppm	0.14	0.
CYANIDE (TOTAL). ppm			O&G. ppm		
CYANIDE (RELEASABLE). ppm			COPPER. ppm	0.10	0.
BORON ppm			LEAD. ppm	0.46	0.
CADMIUM. ppm	0.1	0.1	MERCURY. ppb		
CHROMIUM (TOTAL). ppm	1.58	1.71	Tl. ppm		
CHROMIUM (HEX). ppm					

ACCEPTED. Chlorinated Phenols/Phenols Mix REJECTED:

COMMENTS Phenol + 1,1-Dichloroethylene Oxydation
H_2O_2 + NaOH ⇒ Phenol = <2.0 ppm
1,1-Dichloroethylene = <0.5

California

Yes ___ N

Please Ch

Sent for C

Fax 1-219-322-0440

REPORT TO:

Doug Doxtor
American Energy Products
6373 Melton Rd.
Portage, IN 46368

TRANSPORT SERVICE COMPANY

Date: 9/24/90
Recd: 8/31/90
WO #: 22-2819

Laboratory Smp ID No.:	AA19198						
DESCRIPTION: ---> Unless otherwise noted; esults in parts per illion - ppm PARAMETERS:	Wash Rack Water #0095.0461 8/29/90				Detection Limits	Regulatory Level (mg/L)	ST IN Numb
SEMI-VOLATILES-TCLP ORGANICS*							
Cresol, total	ND				0.002 ppm	200.0	D026
1,4-Dichlorobenzene	ND				0.002 ppm	7.5	D027
2,4-Dinitrotoluene	ND				0.002 ppm	0.13	D030
Hexachlorobenzene	ND				0.002 ppm	0.5	D032
Hexachlorobutadiene	ND				0.002 ppm	0.5	D033
Hexachlorethane	ND				0.002 ppm	3.0	D034
Nitrobenzene	ND				0.002 ppm	2.0	D036
Pentachlorophenol	ND				0.002 ppm	100.0	D037
Pyridine	ND				0.002 ppm	5.0	D038
2,4,5-Trichlorophenol	ND				0.002 ppm	400.0	D041
2,4,6-Trichlorophenol	ND				0.002 ppm	2.0	D042

*Analys[illegible] performed after Toxicity Characteristic Leach[illegible] Procedure (TCLP).
ND-[illegible]

REPORT TO:
Doug Dexter
Marion Energy Products
373 Melton Rd.
Portage, IN 46368

Fax 1-219-322-0440

TRANSPORT SERVICE COMPANY

Date: 9/24/90
Recd: 8/31/90
WO #: 22-2819

Laboratory Smp ID No.:	AA18198						
DESCRIPTION: ——> Unless otherwise noted; results in parts per million - ppm). PARAMETERS:	Wash Rack Water #0095.0461 8/29/90				Detection Limits	Regulatory Level (mg/L)	EPA HW Number
VOLATILES-ZHE ORGANICS*							
Benzene	ND				0.002 ppm	0.5	D018
Carbon Tetrachloride	0.081				0.002 ppm	0.5	D019
Chlorobenzene	ND				0.002 ppm	100.0	D021
Chloroform	ND				0.002 ppm	6.0	D022
1,2-Dichloroethane	ND				0.002 ppm	0.5	D028
1,1-Dichloroethylene	2.205				0.002 ppm	0.7	D029
Methyl Ethyl Ketone	ND				0.002 ppm	200.0	D035
Tetrachloroethylene	ND				0.002 ppm	0.7	D039
Trichloroethylene	0.0299				0.002 ppm	0.5	D040
Vinyl Chloride	ND				0.002 ppm	0.2	D043

ZHE=Zero Head Space Extraction
ND=Not Detected

Certified by: Catherine D. Shield

CH... 8656
LOG IN 11-7-90
PERMIT # Supp
HAZ CODES D039

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS
OK ___ ACCEPT ___ REJECT
PRICE
QUOTE

WASTE SOURCE
WASTE GENERATOR Litton Precision
WASTE DESCRIPTION Water Soluble Coolant
RECEIPT DATE VOLUME 30,000 gal/yr.

WASTE CHARACTERISTICS

COLOR/APPEARANCE Grey-Thin
WATER MISCIBILITY +
% FLOATER —
% OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
PH	6.4		Ag, ppm	<0.1	
% TOTAL SOLIDS	1.0		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	0.18	
% SUSPENDED SOLIDS	<0.1		Cd, ppm	<0.1	
% SETTLEABLE SOLIDS			Cr, ppm	1.72	
FLASH POINT °C	>200°F		Cr (Hex), ppm	ND	
OIL AND GREASE, ppm	3420		Cu, ppm	0.82	
PHENOLS ppm	10		Hg, ppb	<3.0	
CHLORIDE ppm			Ni, ppm	0.32	
BROMIDE, ppm			Pb, ppm	0.60	
PHOSPHATE ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	34,000		Zn, ppm	1.78	
BOD ppm			Fe, ppm	16.8	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			Ti ppm	0.14	
CYANIDE ppm (TOTAL)			NH	550	
CYANIDE ppm (RELEASE)	<1.0				
SULFIDE ppm (TOTAL)			TOX ppm		
SULFIDE ppm Rel	<10		TOC ppm	17,700	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 4.2 ml/s 0.1 N NaOH
TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX Samp
% SOLIDS Produced by Volume	62	60	IRON, ppm	4.4	4.
% SOLIDS Produced by Weight	3.7	3.1	NICKEL, ppm	5.7	5.
COD, ppm	16,000	19,200	ZINC, ppm	0.22	0.
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.28	0.
BORON ppm			LEAD, ppm	0.60	0.
CADMIUM, ppm	0.1	0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	2.2	2.1	Tl ppm		
CHROMIUM (HEX), ppm					

ACCEPTED Catherine Rubino / Susan Marcy REJECTED:

COMMENTS $KMnO_4$ - Oxydation for Tetrachloroethylene < 0.1 ppm

California
Yes ___ No
Please Ch
Sent for G

MONITORING AND TECHNOLOGIES, INC.

LABORATORY REPORT

Dombrowski & Holmes, Inc.
5051 S. Western Ave.
Chicago, IL. 60609

Report Date: 10/1/90
Sample Received: 9/18/90

Generator: Litton Industries
Sample Description: Cooling Water Pit Grab
Date: 9/18

Sample No.: 6302

Compounds	Concentration Found In Sample	Concentration Found In Blank	Adjusted Concentration	Method Detection Limit (MDL)	Regula Limi
1. Benzene	<0.25	<0.01	<0.25	0.01	0.50
2. Carbon Tetrachloride	<0.25	<0.01	<0.25	0.01	0.50
3. Chlorobenzene	<50.0	<0.01	<50.0	0.01	100.00
4. Chloroform	<3.0	<0.01	<3.0	0.01	6.00
5. o-Cresol	<100.0	<0.01	<100.0	0.01	200.00
6. m-Cresol	<100.0	<0.01	<100.0	0.01	200.00
7. p-Cresol	<100.0	<0.01	<100.0	0.01	200.00
Total Cresol	<100.0	<0.01	<100.0	0.01	200.00
8. 1,4-Dichlorobenzene	<3.75	<0.01	<3.75	0.01	7.50
9. 1,2-Dichloroethane	<0.25	<0.01	<0.25	0.01	0.50
10. 1,1-Dichloroethane	<0.35	<0.01	<0.35	0.01	0.70
11. 2,4-Dinitrotoluene	<0.07	<0.01	<0.07	0.01	0.13
12. Hexachlorobenzene	<0.07	<0.01	<0.07	0.01	0.13
13. Hexachloro-1,3 -butadiene	<0.25	<0.01	<0.25	0.01	0.50
14. Hexachloroethane	<1.50	<0.01	<1.50	0.01	3.00
15. Methyl Ethyl Ketone	<100.0	<0.01	<100.0	0.01	200.00
16. Nitrobenzene	<1.00	<0.01	<1.00	0.01	2.00
17. Pentachlorophenol	<50.00	<0.01	<50.0	0.01	100.00
18. Pyridine	<2.50	<0.01	<2.50	0.01	5.00
19. Tetrachloroethylene	1.6	<0.01	<0.35	0.01	0.70
20. Trichloroethylene	<0.25	<0.01	<0.25	0.01	0.50
21. 2,4,5-Trichlorophenol	<200.00	<0.01	<200.0	0.01	400.00
22. 2,4,6-Trichlorophenol	<1.00	<0.01	<1.00	0.01	2.00
23. Vinyl Chloride	<0.10	<0.01	<0.10	0.01	0.20

All results expressed as ppm unless otherwise indicated.

Methods performed according to SW-846, "Test Methods for Evaluating Solid Was
Analysis performed on Extract from TCLP.

Leah E. Zebre

LABORATORY DIRECTOR

TOTAL P.C

CHK # 8171
LOG # 12-8-90
PERM # Supp
HAZ CODES D018

Clean Harbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS
OK ___ ACCEPT ✓ RE.
PRICE
QUOTE

WASTE SOURCE
WASTE GENERATOR Superior Carriers
WASTE DESCRIPTION Waste Water from Tank Cleanings
RECEIPT DATE VOLUME 5000 gal 1X

WASTE CHARACTERISTICS

COLOR/APPEARANCE Milky
WATER MISCIBILITY +
% FLOATER —
% OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec	LEACH	TEST	As Rec.	T
PH	6.4		Ag, ppm	<0.1	
% TOTAL SOLIDS	9.20		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	16.8	
% SUSPENDED SOLIDS	0.8		Cd, ppm	0.16	
% SETTLEABLE SOLIDS			Cr, ppm	1.28	
FLASH POINT °C	>200°F		Cr (Hex), ppm	ND	
OIL AND GREASE ppm	116.4		Cu, ppm	2.06	
PHENOLS ppm	<0.5		Hg ppb	<3.0	
CHLORIDE ppm			Ni, ppm	0.82	
BROMIDE, ppm			Pb, ppm	0.80	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	44,000		Zn ppm	8.0	
BOD ppm			Fe, ppm	59.6	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			T ppm	0.70	
CYANIDE ppm (TOTAL)			NH	155.0	
CYANIDE, ppm (RELEASE)	<1.0				
SULFIDE, ppm (TOTAL)			TOX ppm		
SULFIDE ppm rel	<1.0		TOC ppm	28,000	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 2.0 mls 0.1 N NaOH
TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	M S.
% SOLIDS Produced by Volume	73	69	IRON, ppm	11.4	
% SOLIDS Produced by Weight	6.6	5.9	NICKEL, ppm	5.18	
COD, ppm	29,000	20,000	ZINC, ppm	0.78	
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.22	
BORON ppm			LEAD, ppm	0.39	
CADMIUM, ppm	0.1	0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	0.92	1.35	T ppm		
CHROMIUM (HEX), ppm					

ACCEPTED Catherine Perkins / Dr Lad Mayer
REJECTED:
COMMENTS Benzene Oxydation: $KMnO_4$ TCLP Benzene = 0.35 ppm

Californ
Yes
Please C
Sent for

YORK LABORATORIES

Mr. Jim Myczek
Browning Ferris Ind.
8001 West 47th Street
Lyons, IL 60534

August 16, 1990
Sample No. 967-001

Sample Description: Superior Carriers, Neutralized Tank Cleaners: 85
Date Taken: 07-17-90 Date Received: 07-17-90

TCLP ORGANIC COMPOUNDS

EPA HW NUMBER	CONSTITUENT	(MG/L)
D012	ENDRIN	<0.0004
D013	LINDANE	<0.0002
D014	METHOXYCHLOR	<0.002
D015	TOXAPHENE	<0.004
D016	2,4-D	<0.20
D017	2,4,5-TP(SILVEX)	<0.02
D018	BENZENE	0.52
D019	CARBON TETRACHLORIDE	<0.1
D020	CHLORDANE	<0.002
D021	CHLOROBENZENE	<0.1
D022	CHLOROFORM	<0.1
D023	O-CRESOL	<0.02
D024	M-CRESOL	<0.02
D025	P-CRESOL	<0.02
D026	CRESOL	<0.02
D027	1,4-DICHLOROBENZENE	<0.02
D028	1,2-DICHLOROETHANE	<0.1
D029	1,1-DICHLOROETHYLENE	<0.1
D030	2,4-DINITROTOLUENE	<0.02
D031	HEPTACHLOR	0.0009
	(AND ITS EPOXIDE)	
D032	HEXACHLOROBENZENE	<0.02
D033	HEXACHLORO-1,3-BUTADIENE	<0.02
D034	HEXACHLOROETHANE	<0.02
D035	METHYL ETHYL KETONE	<0.1
D036	NITROBENZENE	<0.02
D037	PENTACHLOROPHENOL	<0.12
D038	PYRIDINE	<0.02
D039	TETRACHLOROETHYLENE	<0.1
D040	TRICHLOROETHYLENE	<0.1
D041	2,4,5-TRICHLOROPHENOL	<0.12
D042	2,4,6-TRICHLOROPHENOL	<0.02
D043	VINYL CHLORIDE	<0.2

Data Release Authorized By: [signature]
Mark A. Hartwig, President

CleanHarbors

Client: Clean Harbors of Chicago
Sample I.D.: 8791 SUPERIOR
Sample Type: Liquid

CHAS Lab #: 90X121
Date Received: 12/
Internal Code: VS3(

Volatile Organics - System B
Toxicity Characteristic Leaching Procedure (TCLP)
by EPA Method 8260 (ref. c)

Zero Headspace Extraction Date: 12/31/90

Analysis Date: 01/02/91

Parameter	MDL*	Conc.*	Parameter	MDL*	Cc
Benzene	0.10	0.35	1,1-Dichloroethylene	0.10	ND
Carbon Tetrachloride	0.10	ND	Methyl Ethyl Ketone	0.40	ND
Chlorobenzene	0.10	ND	Tetrachloroethylene	0.10	ND
Chloroform	0.10	ND	Trichloroethylene	0.10	ND
1,2-Dichloroethane	0.10	ND	Vinyl Chloride	0.20	ND

Notes ND - Below minimum detectable level (MDL)
TR - Trace amount present but below MDL
* - mg/l
TCLP - Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.
No additional peaks observed in sample
Sample was less than 5.0% solids. Sample was analyzed as filtrate.

QA/QC

Surrogate Recoveries:		Surrogate Acceptance Criteria: Water	Soil
d4-1,2-Dichloroethane:	96 %	76-114%	70-121%
d8-Toluene:	105 %	88-110%	84-138%
p-BFB:	99 %	86-115%	59-113%

CHI # 9024
2-5-91

PERMIT # _____

HAZ CODES D040

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS ✓
OK ___ ACCEPT ✓ REJE
PRICE _____
QUOTE _____

WASTE SOURCE
WASTE GENERATOR Roper Whitney
WASTE DESCRIPTION Waste Coolant
RECEIPT DATE VOLUME 2000 gal / grt

WASTE CHARACTERISTICS

COLOR/APPEARANCE Green/Thin
WATER MISCIBILITY Bottom +
% FLOATER oil - 2-3%
% OIL ON ACIDIFICATION —
% FREE OIL 2-3%

TEST	As Rec.	LEACH	TEST	As Rec.	TCLI
PH	8.0		Ag. ppm	0.37	
% TOTAL SOLIDS	5.9		As. ppm	<0.1	
% DISSOLVED SOLIDS			Ba. ppm	1.74	
% SUSPENDED SOLIDS	0.47		Cd. ppm	0.20	
% SETTLEABLE SOLIDS			Cr. ppm	2.66	
FLASH POINT °C	>200°F		Cr (Hex). ppm	ND	
OIL AND GREASE. ppm	13728		Cu. ppm	1.68	
PHENOLS ppm	<0.5		Hg. ppb	<3.0	
CHLORIDE. ppm			Ni. ppm	0.90	
BROMIDE. ppm			Pb ppm	2.07	<0.(
PHOSPHATE. ppm (TOTAL)			Se. ppm	<0.1	
COD ppm	80,000		Zn. ppm	7.60	
BOD ppm			Fe ppm	408	
ACIDITY mg/l as $CaCo_3$					
ALKALINITY mg/l as $CaCo_3$			[illegible]	0.0%	
CYANIDE. ppm (TOTAL)			NH	ND	
CYANIDE. ppm (RELEASE)	<1.0				
SULFIDE. ppm (TOTAL)			TOX ppm		
SULFIDE. ppm sol	40		TOC ppm	6700	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 20 mls 0.1 N NaOH: 10 mls sample
TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX Samc
% SOLIDS Produced by Volume	5.5	5.8	IRON. ppm	24.4	23.
% SOLIDS Produced by Weight	5.3	4.8	NICKEL. ppm	9.0	9.4
COD. ppm	19,200	12,000	ZINC. ppm	8.8	8.1
CYANIDE (TOTAL). ppm			O&G. ppm		
CYANIDE (RELEASABLE). ppm			COPPER. ppm	0.51	0.5
BORON ppm			LEAD. ppm	0.22	0.2
CADMIUM. ppm	<0.1	<0.1	MERCURY. ppb		
CHROMIUM (TOTAL). ppm	1.6	1.4	Tl ppm		
CHROMIUM (HEX). ppm					

ACCEPTED Contact Petro / Mobil Lab
REJECTED:

COMMENTS Pretreat Trichloroethane - Oxydation with $KMnO_4$ = 0.1 ppm

California L
Yes ____ No
Please Che

Sent for G

CleanHarbors

Client: Clean Harbors of Chicago
Sample I.D.: B 9106
Sample Type: Liquid

CHAS Lab #: 91X031
Date Received: 03
Internal Code: VS3

Volatile Organics - System D
Toxicity Characteristic Leaching Procedure (TCLP)
by EPA Method 8260 (ref. c)

Zero Headspace Extraction Date: 03/24/91

Analysis Date: 03/26/91

Parameter	MDL*	Conc.*	Parameter	MDL*	C
Benzene	0.10	ND	1,1-Dichloroethylene	0.10	N
Carbon Tetrachloride	0.10	ND	Methyl Ethyl Ketone	0.40	N
Chlorobenzene	0.10	ND	Tetrachloroethylene	0.10	N
Chloroform	0.10	ND	Trichloroethylene	0.10	N
1,2-Dichloroethane	0.10	ND	Vinyl Chloride	0.20	N

Notes ND - Below minimum detectable level (MDL)
TR - Trace amount present but below MDL
* - mg/l
TCLP - Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

QA/QC

Surrogate Recoveries:		Surrogate Acceptance Criteria: Water	Soil
d4-1,2-Dichloroethane:	91 %	76-114%	70-121%
d8-Toluene:	103 %	88-110%	84-138%
p-BFB:	103 %	86-115%	59-113%

gabriel laboratories, ltd.
Environmental & Energy Services

CLIENT: Roper Whitney

DATE SAMPLE RECEIVED: August 31, 1990
SAMPLE DESCRIPTION: Waste Coolant
SAMPLE TYPE: Waste Coolant
SAMPLE DATE: August 31, 1990
SAMPLE LOG #: R920-90

BASE NEUTRALS & ACID EXTRACTABLES

ANALYTE	CAS Number	Concentration	Minimum Detection Limit	
1,4-dichlorobenzene	106-46-7	UNDETECTED	90.0	ug/l
Hexachloroethane	67-72-1	UNDETECTED	90.0	ug/l
Nitrobenzene	98-95-3	UNDETECTED	90.0	ug/l
Hexachlorobutadiene	87-68-3	UNDETECTED	90.0	ug/l
2,4,6- Trichlorophenol	88-06-2	UNDETECTED	90.0	ug/l
2,4-Dinitrotoluene	121-14-2	UNDETECTED	90.0	ug/l
Hexachlorobenzene	118-74-1	UNDETECTED	90.0	ug/l
Pentachlorophenol	87-86-5	UNDETECTED	180	ug/l
2,4,5-Trichlorophenol	95-95-4	UNDETECTED	180	ug/l
Pyridine	110-86-1	UNDETECTED	90.0	ug/l
Cresol	95-48-7	UNDETECTED	90.0	ug/l

PURGEABLE ORGANICS

Vinyl Chloride	75-01-4	UNDETECTED	200	ppb
1,1-Dichloroethene	75-35-4	UNDETECTED	100	ppb
Chloroform	67-66-3	UNDETECTED	100	ppb
Carbon Tetrachloride	56-23-5	UNDETECTED	100	ppb
1,2-Dichloroethane	107-06-2	UNDETECTED	100	ppb
Trichloroethene	79-01-6	2760	100	ppb
Tetrachlorethene	127-18-4	UNDETECTED	100	ppb
Chlorobenzene	108-90-7	UNDETECTED	100	ppb
Benzene	71-43-2	UNDETECTED	100	ppb
Methyl Ethyl Ketone	78-93-3	UNDETECTED	1000	ppb
1,4-Dichlorobenzene	106-46-7	UNDETECTED	100	ppb

ANALYSIS APPROVED Scott H. Schutte DATE December 5, 1990
All analysis performed according to USEPA test methods.
*BQL means that the compound was detected below detection limit

CH # 8647
DATE 11-7-90
PERMIT # SPP
HAZ CODES D030, D032, D040

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS 11-20-
OK ___ ACCEPT ✓ REJECT
PRICE ___
QUOTE ___

WASTE SOURCE
WASTE GENERATOR In-Sink-Erator
WASTE DESCRIPTION Coolant Water
RECEIPT DATE
VOLUME 2000 gal/gst

WASTE CHARACTERISTICS

COLOR APPEARANCE Green-Cloudy
WATER MISCIBILITY +
% FLOATER <1% Oil
% OIL ON ACIDIFICATION —
% FREE OIL <1%

TEST	As Rec	LEACH	TEST	As Rec.	LEACH
PH	9.4		Ag ppm	0.1	
% TOTAL SOLIDS	1.81		As ppm	<0.1	
% DISSOLVED SOLIDS			Ba. ppm	0.4	
% SUSPENDED SOLIDS	<0.1		Cd ppm	0.1	
% SETTLEABLE SOLIDS			Cr ppm	<0.1	
FLASH POINT °C	>200°F		Cr (Hex) ppm	ND	
OIL AND GREASE ppm	2162		Cu. ppm	1.5	
PHENOLS ppm	<0.5		Hg ppb	<3.0	
CHLORIDE ppm			Ni. ppm	1.8	
BROMIDE ppm			Pb ppm	<1.0	
PHOSPHATE ppm (TOTAL)			Se ppm	<0.1	
COD ppm	78,400		Zn ppm	4.2	
BOD ppm			Fe ppm	16.5	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			[illegible]	0.3	
CYANIDE ppm (TOTAL)			[illegible]	ND	
CYANIDE ppm (RELEASE)	<1.0				
SULFIDE ppm (TOTAL)			[illegible]		
SULFIDE ppm Sed	<10		[illegible]	15000	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 1.0 mls 0.1 N NaOH: 10 mls sample
TREATMENT WITH MIX TANK (5 ml WASTE + 95 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX Sampl
% SOLIDS Produced by Volume	43	47	IRON. ppm	8.4	3.1
% SOLIDS Produced by Weight	3.38	3.91	NICKEL. ppm	6.8	6.4
COD. ppm	24800	25600	ZINC. ppm	0.13	0.16
CYANIDE (TOTAL). ppm			O&G. ppm		
CYANIDE (RELEASABLE) ppm			COPPER ppm	0.23	0.21
BORON ppm			LEAD. ppm	0.39	0.46
CADMIUM ppm	0.1	0.1	MERCURY ppb		
CHROMIUM (TOTAL). ppm	1.3	1.1	[illegible] ppm		
CHROMIUM (HEX). ppm					

ACCEPTED [illegible] REJECTED

COMMENTS
Protest — $KMnO_4$ Oxydation
2,4-Dinitrotoluene = <0.13 ppm
[illegible] = <0.13 ppm

California Lic
Yes ___ No
Please Chec
Sent for G

ENVIRONMENTAL SERVICES
CHEMBIO CORPORATION
140 EAST RYAN ROAD OAK CREEK, WI 53154-4599 (414) 764-7005

I041 8452798

IN-SINK-ERATOR
4700 - 21ST STREET
RACINE , ,WI 53406
ATTN: BRIAN FREITAG

SAMPLE 90199-100582 90001/WASTE COOLANT/7-16
DATE COLLECTED 07/16/90 DATE RECEIVED 07/18/90

TEST NAME	RESULT	UNITS	EP RESULT	TCLP RESULT		LIMIT
TRICHLOROETHYLENE-TCLP				0.77	MG/L	0.5
O-CRESOL-TCLP				<0.10	MG/L	200.0
M-CRESOL-TCLP				<0.10	MG/L	200.0
P-CRESOL-TCLP				<0.10	MG/L	200.0
METHYL ETHYL KETONE-TCLP				<0.10	MG/L	200.0
PYRIDINE-TCLP				<0.10	MG/L	5.0
BENZENE-TCLP				<0.10	MG/L	0.5
CHLOROBENZENE-TCLP				<0.10	MG/L	100.0
HEXACHLOROETHANE-TCLP				0.54	MG/L	3.0
1,4-DICHLOROBENZENE-TCLP				<0.10	MG/L	7.5
2,4-DINITROTOLUENE-TCLP				1.6	MG/L	0.13
HEXACHLOROBENZENE-TCLP				7.6	MG/L	0.13
HEXACHLOROBUTADIENE-TCLP				<0.10	MG/L	0.5
NITROBENZENE-TCLP				<0.10	MG/L	2.0
2,4,5-TRICHLOROPHENOL-TCLP				<0.25	MG/L	400.0
PENTACHLOROPHENOL-TCLP				2.3	MG/L	100.0
2,4,6-TRICHLOROPHENOL-TCLP				<0.25	MG/L	2.0
TOXAPHENE - TCLP				<0.0002	MG/L	0.5
CHLORDANE-TCLP				<0.0002	MG/L	0.03
ENDRIN-TCLP				<0.0002	MG/L	0.02
HEPTACHLOR-TCLP				<0.0002	MG/L	0.008
LINDANE (GAMMA BHC)-TCLP				<0.0002	MG/L	0.4
METHOXYCHLOR-TCLP				<0.0002	MG/L	10.0
2,4-D-TCLP				<0.0020	MG/L	10.0
2,4,5-TP (SILVEX)-TCLP				<0.0005	MG/L	1.0
PCB'S - SOLIDS, OIL, WASTE	<10	@ PPM				
TCLP EXT. VOLATILE				COMPLETE	PPM	
	07-26-90					

PLEASE CONTACT CLIENT SERVICES WITH ANY QUESTIONS. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT ; NON-W
SAMPLES WILL BE RETURNED 6 WEEKS AFTER RECEIPT. N/T = NOT TESTED, N/A = NOT APPLICABLE.
@ = ELEVATED DETECTION LIMIT DUE TO MATRIX INTERFERENCE. # = ELEVATED DETECTION LIMIT DUE TO SAMPLE CONCENTRA
$ = ELEVATED DETECTION LIMIT DUE TO SAMPLE VOLUME.
IL EPA CERTIFICATION # 100243; AIHA ACCREDITED. APPROVAL

CH # 8313
LOG IN 9490
PERMIT #
HAZ CODES D029, 39, 40

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS
OK ___ ACCEPT ✓ REJE
PRICE
QUOTE

WASTE SOURCE
WASTE GENERATOR Waste Research
WASTE DESCRIPTION Process Waters
RECEIPT DATE
VOLUME 150,000 gal/yr.

WASTE CHARACTERISTICS

COLOR/APPEARANCE Yellow - Thin
WATER MISCIBILITY +
% FLOATER —
% OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
PH	4.3		Ag, ppm	<0.1	
% TOTAL SOLIDS	0.12		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	0.10	
% SUSPENDED SOLIDS	<0.1		Cd, ppm	<0.1	
% SETTLEABLE SOLIDS			Cr, ppm	0.22	
FLASH POINT °C	>140°F		Cr (Hex), ppm	ND	
OIL AND GREASE ppm	206		Cu, ppm	0.36	
PHENOLS ppm	12.0		Hg, ppb	<3.0	
CHLORIDE ppm			Ni, ppm	0.14	
BROMIDE, ppm			Pb, ppm	0.34	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	4800		Zn, ppm	1.32	
BOD ppm			Fe, ppm	9.2	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY, mg/l as $CaCO_3$			Tl ppm	<0.1	
CYANIDE, ppm (TOTAL)			NH	ND	
CYANIDE, ppm (RELEASE)	<1.0				
SULFIDE, ppm (TOTAL)			TOX ppm		
SULFIDE, ppm rel	<10		TOC ppm	1900	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 0.7 mls 0.1 N NaOH: 10 mls Sample
TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	47	50	IRON, ppm	0.80	0.3
% SOLIDS Produced by Weight	3.16	3.93	NICKEL, ppm	1.14	0.85
COD, ppm	20,000	16,000	ZINC, ppm	0.12	0.1
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.81	0.6
BORON ppm			LEAD, ppm	0.40	0.3
CADMIUM, ppm	0.1	<0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	1.55	1.14	Tl ppm		
CHROMIUM (HEX), ppm					

ACCEPTED: [signature] / [signature] REJECTED:

COMMENTS Treatment after phenol oxydation
$KMnO_4$ Oxidation: 1,1-Dichloroethylene = <0.7 ppm
Tetrachloroethylene = <0.7 ppm
Trichloroethylene = <0.5 ppm

California Li
Yes ___ No ___
Please Chec
Sent for G.C

CleanHarbors

Client: VR & R
Sample ID: CHI 8373
Sample Type: Liquid

CHAS Lab #: 90X10110-01M
Date Received: 10/17/90
Internal Code: SS30

Semi-Volatile Base/Neutral and Acid Extractable Organics
Toxicity Characteristic Leaching Procedure(TCLP)
by EPA Methods 3510/8270 (ref.c)

TCLP Extraction Date: 10/30/90
BNA Extraction Date: 11/01/90
Analysis Date: 11/03/90

Parameter	MDL*	Conc.	Parameter	MDL*	Co
Total Cresols	0.50	ND	Nitrobenzene	0.50	
1,4-Dichlorobenzene	0.50	ND	Pentachlorophenol	2.5	
2,4-Dinitrotoluene	0.50	ND	Pyridine	0.50	
Hexachlorobenzene	0.50	ND	2,4,5-Trichlorophenol	2.5	
Hexachlorobutadiene	0.50	ND	2,4,6-Trichlorophenol	2.5	
Hexachloroethane	0.50	ND			

Notes:
ND = Below minimum detectable level (MDL)
* = mg/l
NA = Not applicable due to sample dilution
Surrogates diluted out; Dilution due to presence of non-target compounds
TCLP = Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

QA/QC

Surrogate Recoveries:		Surrogate Acceptance Criteria:
2-Fluorophenol	NA%	25% - 121%
Phenol-D5	NA%	24% - 113%
Nitrobenzene-D5	NA%	23% - 120%
2-Fluorobiphenyl	NA%	30% - 115%
2,4,6-Tribromophenol	NA%	19% - 122%
Terphenyl-D14	NA%	18% - 137%

CleanHarbors

Client: WR&R
Sample I.D.: CHI 8373
Sample Type: Liquid

CHAS Lab #: 90X101
Date Received: 1C
Internal Code: VS3

Volatile Organics - System A
Toxicity Characteristic Leaching Procedure (TCLP)
by EPA Method 8240 (ref. c)

Zero Headspace Extraction Date: 11/09/90

Analysis Date: 11/09/90

Parameter	MDL*	Conc.*	Parameter	MDL*
Benzene	0.10	ND	1,1-Dichloroethylene	0.10
Carbon Tetrachloride	0.10	ND	Methyl Ethyl Ketone	0.40
Chlorobenzene	0.10	ND	Tetrachloroethylene	0.10
Chloroform	0.10	ND	Trichloroethylene	0.10
1,2-Dichloroethane	0.10	TR	Vinyl Chloride	0.20

Notes ND - Below minimum detectable level (MDL)
TR - Trace amount present but below MDL
* - mg/l
TCLP - Toxicity Characteristic Leaching Procedure, EPA Method 1311 as described in the Federal Register, Volume 55, No. 126.

QA/QC

Surrogate Recoveries:		Surrogate Acceptance Criteria: Water	Soil
d4-1,2-Dichloroethane:	96 %	76-114%	70-121%
d8-Toluene:	103 %	88-110%	84-138%
p-BFB:	96 %	86-115%	59-113%

CH # 9162
LOG IN 3/8/91
PERMIT #
HAZ CODES

Harbors
...AL SERVICES COMPANIES
...Stony Island Avenue
...icago, Illinois 60617
(312) 646-6202

LAB ANALYSIS
OK ___ ACCEPT ___ REJECT
PRICE
QUOTE

WASTE SOURCE Clark Oil
WASTE GENERATOR Clark Oil
WASTE DESCRIPTION Sludge
RECEIPT DATE
VOLUME 20 loads NOW

WASTE CHARACTERISTICS

COLOR/APPEARANCE Black OPAQUE
WATER MISCIBILITY +
% FLOATER —
% OIL ON ACIDIFICATION —
% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
PH	7.7		Ag, ppm	1.90	
% TOTAL SOLIDS	23.06		As, ppm	.78	
% DISSOLVED SOLIDS			Ba, ppm	274.0	
% SUSPENDED SOLIDS	25.00		Cd, ppm	1.0	
% SETTLEABLE SOLIDS			Cr, ppm	5240	
FLASH POINT °C			Cr (Hex), ppm	ND	
OIL AND GREASE ppm	32,404		Cu, ppm	192	
PHENOLS ppm	3.2		Hg, ppb	343.7	
CHLORIDE, ppm			Ni, ppm	13.6	
BROMIDE, ppm			Pb, ppm	35.0	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	<800		Zn, ppm	7200	
BOD ppm			Fe, ppm	15,160	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY, mg/l as $CaCO_3$			Tl ppm	1.10	
CYANIDE, ppm (TOTAL)			NH_3	ND	
CYANIDE, ppm (RELEASE)	<1.0				
SULFIDE, ppm (TOTAL)			TOX ppm		
SULFIDE, ppm Rel +	17.0		TOC ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10)
TREATMENT WITH MIX TANK (ml WASTE + ml MIX TANK)

TEST	MIX TANK	~~MIX + Sample~~ FIH 50/50 w/mt.		MIX TANK	~~MIX + Sample~~
% SOLIDS Produced by Volume			IRON, ppm		4.0
% SOLIDS Produced by Weight			NICKEL, ppm		1.6
COD, ppm			ZINC, ppm		0.28
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm		0.10
BORON, ppm			LEAD, ppm		0.19
CADMIUM, ppm		<0.1	MERCURY, ppb		<1.0
CHROMIUM (TOTAL), ppm		0.38	Tl, ppm		
CHROMIUM (HEX), ppm					

ACCEPTED:
REJECTED:

COMMENTS - filter 50/50 against white tank - record all chemicals used based on to 100 ml sample.
Presowork 20 bus Lime → press 50/50 with white tank
3 bdgs sulfide
Hg < 1.0 ppb

California List
Yes ___ No ___
Please Check
Sent for G C

CHI # [illegible]

LOG IN [illegible]

PERMIT # [illegible]

HAZ CODES [illegible]

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS [illegible]

OK ___ ACCEPT ✓ REJECT.

PRICE [illegible]

QUOTE [illegible]

WASTE SOURCE

WASTE GENERATOR [illegible]

WASTE DESCRIPTION [illegible]

RECEIPT DATE

VOLUME 300 [illegible]

WASTE CHARACTERISTICS

COLOR/APPEARANCE [illegible] WATER MISCIBILITY T

% FLOATER — % OIL ON ACIDIFICATION —

% FREE OIL —

TEST	As Rec.	LEACH.	TEST	As Rec.	EPT
PH	7.0		Ag, ppm	[illegible]	
% TOTAL SOLIDS	[illegible]		As, ppm	[illegible]	
% DISSOLVED SOLIDS			Ba, ppm	[illegible]	
% SUSPENDED SOLIDS	0.14		Cd, ppm	[illegible]	
% SETTLEABLE SOLIDS			Cr, ppm	[illegible]	
FLASH POINT °C	>200 F		Cr (Hex), ppm	[illegible]	
OIL AND GREASE, ppm	183		Cu, ppm	[illegible]	
PHENOLS, ppm	<0.0		Hg, ppb	5.0	
CHLORIDE, ppm			Ni, ppm	[illegible]	
BROMIDE, ppm			Pb, ppm	[illegible]	
PHOSPHATE, ppm (TOTAL)			Se, ppm	[illegible]	
COD, ppm	18,000		Zn, ppm	[illegible]	
BOD, ppm			Fe, ppm	[illegible]	
ACIDITY mg/l as $CaCo_3$					
ALKALINITY, mg/l as $CaCo_3$			Tl, ppm	[illegible]	
CYANIDE, ppm (TOTAL)			NH_3	[illegible]	
CYANIDE, ppm (RELEASE)	<1.0				
SULFIDE, ppm (TOTAL)			TOX, ppm		
SULFIDE, ppm	[illegible]		TOC, ppm	[illegible]	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) [illegible] N NaOH [illegible]

TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	50	50	IRON, ppm	[illegible]	
% SOLIDS Produced by Weight	[illegible]	[illegible]	NICKEL, ppm	[illegible]	
COD, ppm	[illegible]	[illegible]	ZINC, ppm	[illegible]	
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	[illegible]	
BORON, ppm			LEAD, ppm	[illegible]	
CADMIUM, ppm	[illegible]	[illegible]	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	[illegible]	[illegible]	Tl, ppm		
CHROMIUM (HEX), ppm					

ACCEPTED: [illegible] REJECTED:

COMMENTS Sample treated at 100%
[illegible] precipitation + hydroxide precipitation followed
by acid in precipitation to pH of 9.0 or Hg = <2.0 ppb

California List

Yes ___ No ✓

Please Check

Sent for G.C.

CHI # 6342

LOG IN 4-16-93

PERMIT #

HAZ CODES NON

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS [illegible]

OK ___ ACCEPT ✓ REJECT.

PRICE

QUOTE

WASTE SOURCE Volnik

WASTE GENERATOR Essential Industries

WASTE DESCRIPTION Waste water

RECEIPT DATE

VOLUME [illegible] gal [illegible]

WASTE CHARACTERISTICS

COLOR/APPEARANCE Dry Foamy

WATER MISCIBILITY +

% FLOATER Foam

% OIL ON ACIDIFICATION —

% FREE OIL —

TEST	As Rec.	LEACH.	TEST	As Rec.	EPT
PH	9.6		Ag, ppm	<0.1	
% TOTAL SOLIDS	3.76		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	0.16	
% SUSPENDED SOLIDS	<0.1		Cd, ppm	<0.1	
% SETTLEABLE SOLIDS			Cr, ppm	<2.0	
FLASH POINT °C	>200°F		Cr (Hex), ppm	ND	
OIL AND GREASE, ppm	398		Cu, ppm	2.2	
PHENOLS, ppm	<0.5		Hg, ppb	56.0	
CHLORIDE, ppm			Ni, ppm	<2.0	
BROMIDE, ppm			Pb, ppm	<2.0	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.2	
COD, ppm	140,000		Zn, ppm	68.[illegible]	
BOD, ppm			Fe, ppm	15.0	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY, mg/l as $CaCO_3$			Tl ppm	<0.1	
CYANIDE, ppm (TOTAL)			NH_3	ND	
CYANIDE, ppm (RELEASE)	<1.0				
SULFIDE, ppm (TOTAL)			TOX ppm		
SULFIDE, ppm	<10		TOC ppm	12,500	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 2.[illegible] mls 0.1 N NaOH 10 mls sample

TREATMENT WITH MIX TANK (10 ml WASTE + 90 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	45	45	IRON, ppm	[illegible]	[illegible]
% SOLIDS Produced by Weight	1.62	0.96	NICKEL, ppm	1.91	1.95
COD, ppm	8000	16000	ZINC, ppm	[illegible]	[illegible]
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	<0.1	<1
BORON, ppm			LEAD, ppm	0.12	0.12
CADMIUM, ppm	<0.1	<0.1	MERCURY, ppb [illegible]	<2.0	
CHROMIUM (TOTAL), ppm	0.12	0.10	Tl ppm		
CHROMIUM (HEX), ppm					

ACCEPTED:

REJECTED:

COMMENTS Sample treated at 100% Hydroxide precipitation, Alum coagulation to pH of 9, Sulfide precipitation = [illegible] = <2.0 ppb

California List

Yes ___ No ✓

Please Check

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T. [illegible]

CH# 9235

LOG IN 3/26/91

PERMIT # Supplementary 900899

HAZ CODES NON

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11000 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS

OK ___ ACCEPT ✓ REJECT

PRICE 62¢

QUOTE

WASTE SOURCE INTERSOL

WASTE GENERATOR UNOCAL

WASTE DESCRIPTION STREET FORD SOLUTION & WASTEWATER

RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE Flesh Brown

WATER MISCIBILITY +

% FLOATER —

% OIL ON ACIDIFICATION —

% FREE OIL —

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
PH	9.9		Ag, ppm	0.5	
% TOTAL SOLIDS	.30		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	1.10	
% SUSPENDED SOLIDS	.30		Cd, ppm	0.3	
% SETTLEABLE SOLIDS			Cr, ppm	1.2	
FLASH POINT °C			Cr (Hex), ppm	ND	
OIL AND GREASE ppm	518		Cu, ppm	1.8	treated
PHENOLS ppm	<0.5		Hg, ppb	26.69	<1.0
CHLORIDE, ppm			Ni, ppm	1.2	
BROMIDE, ppm			Pb, ppm	1.9	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	64,000		Zn, ppm	1.4	
BOD ppm	/		Fe, ppm	21.4	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY mg/l as $CaCO_3$			Tl ppm	0.9	
CYANIDE, ppm (TOTAL)			NH_3	ND	
CYANIDE, ppm (RELEASE)	<1.0				
SULFIDE, ppm (TOTAL)	12.0		TOX ppm		
SULFIDE, ppm Neg +			TOC ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 3.2 meq 0.1 N NaOH

TREATMENT WITH MIX TANK 10 ml WASTE + 90 ml MIX TANK

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	68	67	IRON, ppm	19.4	23
% SOLIDS Produced by Weight	3.22	3.65	NICKEL, ppm	1.52	2.06
COD, ppm	13,200	12,000	ZINC, ppm	2.60	6.40
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	0.14	4.72
BORON ppm			LEAD, ppm	0.25	0.63
CADMIUM, ppm	0.1	0.13	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	1.35	1.95	Tl, ppm		
CHROMIUM (HEX), ppm					

ACCEPTED.

REJECTED:

COMMENTS ~~Pass~~ 50/50 W/CORC 50 bags lime ~~5 bags~~ sulfide

	SB	Cu	Fe	Mn	Cd	Pb	Zn	
	0.48	~~0.83~~	5.6	~~2.5~~	0.3	(1.44)	4.2	~~Sample must go through press~~
~~Pass~~	~~0.55~~	<0.1	4.6	2.5	<0.1	~~0.38~~	5.8	~~50/50~~
MITR	0.42	0.12	3.7	2.4	<0.1	0.47	~~5.0~~	50 bags lime / 5 bags sulfide

- Run Hot to Mix tank

California Lis

Yes ___ No ___

Please Chec

G.C

CHI # 7808

LOG IN 5-16-90

PERMIT # CC021

HAZ CODES [illegible]

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11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS ✓

OK ___ ACCEPT ✓ REJECT

PRICE ___

QUOTE ___

WASTE SOURCE Mr F

WASTE GENERATOR [illegible]

WASTE DESCRIPTION [illegible] Sample Waste

RECEIPT DATE ___ VOLUME [illegible]

WASTE CHARACTERISTICS

COLOR/APPEARANCE Brown / Thin

WATER MISCIBILITY +

% FLOATER —

% OIL ON ACIDIFICATION —

% FREE OIL —

TEST	As Rec.	LEACH.	TEST	As Rec.	TCLP
PH	0.9		Ag, ppm	0.54	
% TOTAL SOLIDS	13.11		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	2.30	
% SUSPENDED SOLIDS	0.19		Cd, ppm	0.2	
% SETTLEABLE SOLIDS			Cr, ppm (+)	7360	24
FLASH POINT °C			Cr (Hex), ppm	—	
OIL AND GREASE, ppm	<1.0		Cu, ppm	86.0	
PHENOLS, ppm	<1.0		Hg, ppb	75	
CHLORIDE, ppm			Ni, ppm	1.18	
BROMIDE, ppm			Pb, ppm	96	91
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	14,400		Zn, ppm	576	
BOD, ppm			Fe, ppm	440	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY, mg/l as $CaCO_3$			Tl, ppm	1.80	
CYANIDE, ppm (TOTAL)			NH_3		
CYANIDE, ppm (RELEASE)	<1.0				
SULFIDE, ppm (TOTAL)			TOX, ppm		
SULFIDE, ppm (Rel)	<1.0		TOC, ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) 161 ml 0.1 N NaOH

TREATMENT WITH MIX TANK (1 ml WASTE + 99 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX Sampl
% SOLIDS Produced by Volume	45	40	IRON, ppm	1.71	2.0
% SOLIDS Produced by Weight	1.48	1.95	NICKEL, ppm	4.02	4.3
COD, ppm	8800	9600	ZINC, ppm	0.36	2.3
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	1.41	2
BORON, ppm			LEAD, ppm	0.25	0.4
CADMIUM, ppm	0.1	0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm	0.17	0.70	Tl, ppm		
CHROMIUM (HEX), ppm					

ACCEPTED:

REJECTED:

COMMENTS MERCURY DEMONSTRATION

100% Sc — Hg = <3.0 ppb.

Sample treated at 100% - Hydroxide Precipitation - Alum Coagulation

[illegible] = 27.0 ppb

California L

Yes ✓ No

Please Che

Sent for G.

CHI # 1255

LOG IN [illegible]

PERMIT #

HAZ CODES NON

Clean Harbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS [illegible]

OK ___ ACCEPT ✓ REJECT

PRICE

QUOTE

WASTE SOURCE [illegible]

WASTE GENERATOR [illegible]

WASTE DESCRIPTION [illegible]

RECEIPT DATE

VOLUME [illegible]

WASTE CHARACTERISTICS

COLOR/APPEARANCE [illegible]

WATER MISCIBILITY [illegible]

% FLOATER [illegible]

% OIL ON ACIDIFICATION —

% FREE OIL —

TEST	As Rec.	LEACH.	TEST	As Rec.	EPT
PH	9.1		Ag, ppm	<0.1	
% TOTAL SOLIDS	0.1		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	<0.1	
% SUSPENDED SOLIDS	<0.1		Cd, ppm	<0.1	
% SETTLEABLE SOLIDS			Cr, ppm	3.1	
FLASH POINT °C	>200°F		Cr (Hex), ppm	ND	
OIL AND GREASE, ppm	196		Cu, ppm	1.5	
PHENOLS, ppm	5.5		Hg, ppb	40.0	
CHLORIDE, ppm			Ni, ppm	<0.1	
BROMIDE, ppm			Pb, ppm	0.18	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	4000		Zn, ppm	0.2	
BOD, ppm			Fe, ppm	0.2	
ACIDITY mg/l as $CaCO_3$					
ALKALINITY, mg/l as $CaCO_3$			Tl, ppm	<0.2	
CYANIDE, ppm (TOTAL)			NH_3	ND	
CYANIDE, ppm (RELEASE)	<10				
SULFIDE, ppm (TOTAL)			TOX ppm		
SULFIDE, ppm	<10		TOC ppm	1080	

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10) [illegible] ml 0.1 N NaOH - 10 mls sample

TREATMENT WITH MIX TANK ([illegible] ml WASTE + 99 ml MIX TANK)

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume	40	40	IRON, ppm	3.4	[illegible]
% SOLIDS Produced by Weight	3.45	3.16	NICKEL, ppm	11.6	
COD, ppm	2800	2800	ZINC, ppm	[illegible]	[illegible]
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm	[illegible]	[illegible]
BORON, ppm			LEAD, ppm	0.28	[illegible]
CADMIUM, ppm	<0.1	<0.1	MERCURY, ppb [illegible]	<2.0	
CHROMIUM (TOTAL), ppm	[illegible]	[illegible]	Tl ppm		
CHROMIUM (HEX), ppm					

ACCEPTED: [illegible] Rubens [illegible]

REJECTED:

COMMENTS Sample treated at 100% hydroxide precipitation alum coagulation to pH [illegible] sulfide precipitation [illegible] = <2.0 ppb

California List

Yes ___ No ✓

Please Check

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APPENDIX C-3

TREATABILITY OF ORGANIC COMPOUNDS USING CARBON ADSORPTION

ACTIVATED CARBON

AQUA-SCRUB™ Capacity Calculations Using Carbon Adsorption Isotherms For Toxic Organics*

* Table developed from data in EPA - 600/8 - 80 - 023
"CARBON ADSORPTION ISOTHERMS FOR TOXIC ORGANICS"
BY RICHARD A. DOBBS
JESSE M. COHEN
WASTEWATER RESEARCH DIVISION
MUNICIPAL ENVIRONMENTAL RESEARCH LABORATORY
U.S. ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OHIO 45268

For technical assistance contact:
WESTATES CARBON CO., INC.
1919 Raymond Ave., Los Angeles, California 90007
(213) 737-2631
TWX 910 321 2355

Acenaphthene		190	0.36
Acenaphthalene		115	0.37
Acetone cyanohydrin		*not absorbed*	
Acetophenone		74	0.44
2-Acetylaminofluorene		318	0.12
Acridine orange		180	0.29
Acridine yellow		210	0.14
Acrolein		1.20	0.65
Acrylonitrile		1.4	0.51
Adenine		38	0.38
Adipic Acid		20	0.47
Aldrin		651	0.92
4-Aminobiphenyl		200	0.26
Anethole		300	0.42
o-Anisidine		50	0.34
Anthracene		376	0.70
Benzene		1.0	1.6
Benzidine dihydrochloride		220	0.37
Benzoic acid	pH 7	.76	1.8
	pH3	51	0.42
3,4-Benzofluoranthene		57	0.37
Benzo(k)fluoranthene		181	0.57
Benzo(ghi)perylene		10.7	0.37
Benzo(a)pyrene		33.6	0.44
Benzothiazole		120	0.27
alpha-BHC		303	0.43
beta-BHC		220	0.49
gamma-BHC (Lindane)		256	0.49
Bromoform		19.6	0.52
4-Bromophenyl phenyl ether		144	0.68
5-Bromouracil		44	0.47
Butylamine		*not absorbed*	
Butylbenzyl phthalate		1520	1.26
N-Butyl phthalate		220	0.45
Carbon tetrachloride		11.1	0.83
Chlorobenzene		91	0.99
Chlordane		245	0.38
Chloroethane		0.59	0.95
Bis(2-chloroethoxy)methane		11	0.65
Bis(2-chloroethyl)ether		0.086	1.84
2-chloroethyl vinyl ether		3.9	0.80
Chloroform		2.6	0.73
Bis(2-chloroisopropyl)ether		24	0.57
Parachlorometa cresol		122	0.29
2-chloronaphthalene		280	0.46
1-Chloro-2-nitrobenzene		130	0.46
2-Chlorophenol		51.0	0.41
4-Chlorophenyl phenyl ether		111	0.26
5-Chlorouracil		25	0.58
Choline chloride		*not absorbed*	
Cyclohexanone		6.2	0.75
Cyclohexylamine		*not absorbed*	
Cytosine	pH7-9	1.1	1.6
DDE		232	0.37
DDT		322	0.50
Dibenzo(a,h)anthracene		69.3	0.75
Dibromochloromethane		4.8	0.34
1,2-Dibromo-3-chloropropane		53	0.47
1,2-Dichlorobenzene		129	0.43
1,3-Dichlorobenzene		118	0.45
1,4-Dichlorobenzene		121	0.47
3,3-Dichlorobenzidine		300	0.20
Dichlorobromomethane		7.9	0.61
1,1-Dichloroethane		1.79	0.53
1,2-Dichloroethane		3.57	0.83
1,2-trans-Dichloroethene		3.05	0.51
1,1-Dichloroethene		4.91	0.54
2,4-Dichlorophenol		157	0.15
1,2-Dichloropropane		5.86	0.6
1,2-Dichloropropene		8.21	0.46
Dieldrin		606	0.51
Diethylene glycol		*not absorbed*	
Diethyl phthalate		110	0.27
4-Dimethylaminoazobenzene		249	0.24
N-Dimethylnitrosoamine		6.8×10^{-5}	6.6
2,4-Dimethylphenol	pH 3	78	0.44
	pH 5.8	70	0.44
	pH 9	108	0.33
Dimethylphenylcarbinol	pH3	110	0.60
	pH 7	210	0.34
Dimethyl phthalate		97	0.41
4,6-Dinitro-o-cresol	pH 3	237	0.32
	pH 5	169	0.35
	pH 9	42.74	0.90
2,4-Dinitrophenol	pH 3	160	0.37
	pH 7	33	0.61
	pH 9	41	0.25
2,4-Dinitrotoluene		146	0.41
2,6-Dinitrotoluene		145	0.32
Diphenylamine		120	0.31
1,1-Diphenylhydrazine		135	0.16
1,2-Diphenylhydrazine		16,000	2.0
alpha-Endosulfan		194	0.50
beta-Endosulfan		615	0.83
Endosulfan sulfate		686	0.81
Endrin		666	0.80
Ethanol		*not absorbed*	
Ethylbenzene		53	0.79
Ethylenediamine		*not absorbed*	
Ethylenediamenetetraaceticacid (EDTA)		0.86	1.5
bis(2-Ethylhexyl) phthalate		11,300	1.5
Fluoranthene		664	0.61
Fluorene		330	0.28
5-Fluorouracil		5.5	1.0
Guanine	pH 3	75	0.48
	pH 7-9	120	0.40
Heptachlor		1220	0.95
Heptachlor epoxide		1038	0.70
Hexachlorobenzene		450	0.60
Hexachlorobutadiene		258	0.45
Hexachlorocyclopentadiene		370	0.17
Hexachloroethane		96.5	0.38
Hexamethylenediamine		*not absorbed*	
Hydroquinone		90	0.25
Isophorone		32	0.39
Methylene chloride		1.30	1.16
4,4'-Methylene-bis(2-Chloroaniline)		190	0.64
Morpholine		*not absorbed*	
Naphthalene		132	0.42
alpha-Naphthol		180	0.32
beta-Naphthol		200	0.26
alpha-Naphthylamine		140	0.25
beta-Naphthylamine		150	0.30
p-Nitroaniline		140	0.27
Nitrobenzene		68	0.43
4-Nitrobiphenyl		370	0.27
2-Nitrophenol	pH 3	101	0.26
	pH 5.5	99	0.34
	pH 9	85	0.39
4-Nitrophenol	pH 3	80.2	0.17
	pH 5.4	76.2	0.25
	pH 9	71.2	0.28
N-Nitrosodiphenylamine		220	0.37
N-Nitrosodi-n-propylamine		24.4	0.26
p-Nonylphenol	pH 3	53	1.04
	pH 7	250	0.37
	pH 9	150	0.27
PCB 1221		242	0.70
PCB 1232		630	0.73
Pentachlorophenol	pH 3	260	0.39
	pH 7	150	0.42
	pH 9	100	0.41
Phenanthrene		215	0.44
Phenol		21	0.54
Phenylmercuric acetate	pH 3-7	270	0.44
	pH 9	130	0.54
Styrene		120	0.56
1,1,2,2-Tetrachloroethane		10.6	0.37
Tetrachloroethene (tetrachloroethylene)		50.8	0.56
1,2,3,4-Tetrahydronaphthalene		74	0.81
Thymine		27	0.51
Toluene		26.1	0.44
1,2,4-Trichlorobenzene		157	0.31
1,1,1-Trichloroethane		2.48	0.34
1,1,2-Trichloroethane		5.81	0.60
Trichloroethene (Trichloroethylene)		28.0	0.62
Trichlorofluoromethane		5.6	0.24
2,4,6-Trichlorophenol	pH 3	219	0.29
	pH 6	155.1	0.40
	pH 9	130.1	0.39
Triethanolamine		*not absorbed*	
Uracil		11	0.63
p-Xylene		85	0.19

With attention being focused on chemical pollutants in both potable and waste water, a simple method for estimating the effectiveness of granular activated carbon (GAC) for particular priority chemicals in varying concentrations becomes extremely useful. Such a method is available and is described below.

The technique utilizes the extensive data collected by the E.P.A. on the performance of GAC to remove toxic organics from aqueous systems. It must, however, be recognized that the calculation is an approximate one since the actual performance will be influenced by a large number of factors such as interference from other contaminants, temperature, specific type of carbon used, etc.

CALCULATION OF AQUA-SCRUB CAPACITY

The amount of contaminated water that can be treated in an AQUA-SCRUB ASC55 is calculated as follows:

$$Q = 18{,}000 \frac{W}{C}$$

where Q = gallons of water an AQUA-SCRUB ASC55 will treat

C = inlet concentration of organics in mg/l of water.

$\log W = \log K + (A \log C)$

K = a constant for the contaminant, see Table 1

A = a constant for the contaminant, see Table 1

SAMPLE CALCULATION

Problem: How much water can an AQUA-SCRUB ASC55 treat before the carbon is saturated if the water contains 10 mg/1 (10 ppm) of T.C.E.?

Solution:

(a) Determine the values of C, K, and A.

C = 10
K = 28.0 (from Table 1)
A = 0.62 (from Table 1)

(b) Calculate the value of W

$\log W = \log K + (A \log C)$

Using the log graph, Figure 1, $\log K = \log 28.0 = 1.45$

$\log C = \log 10.0 = 1.0$

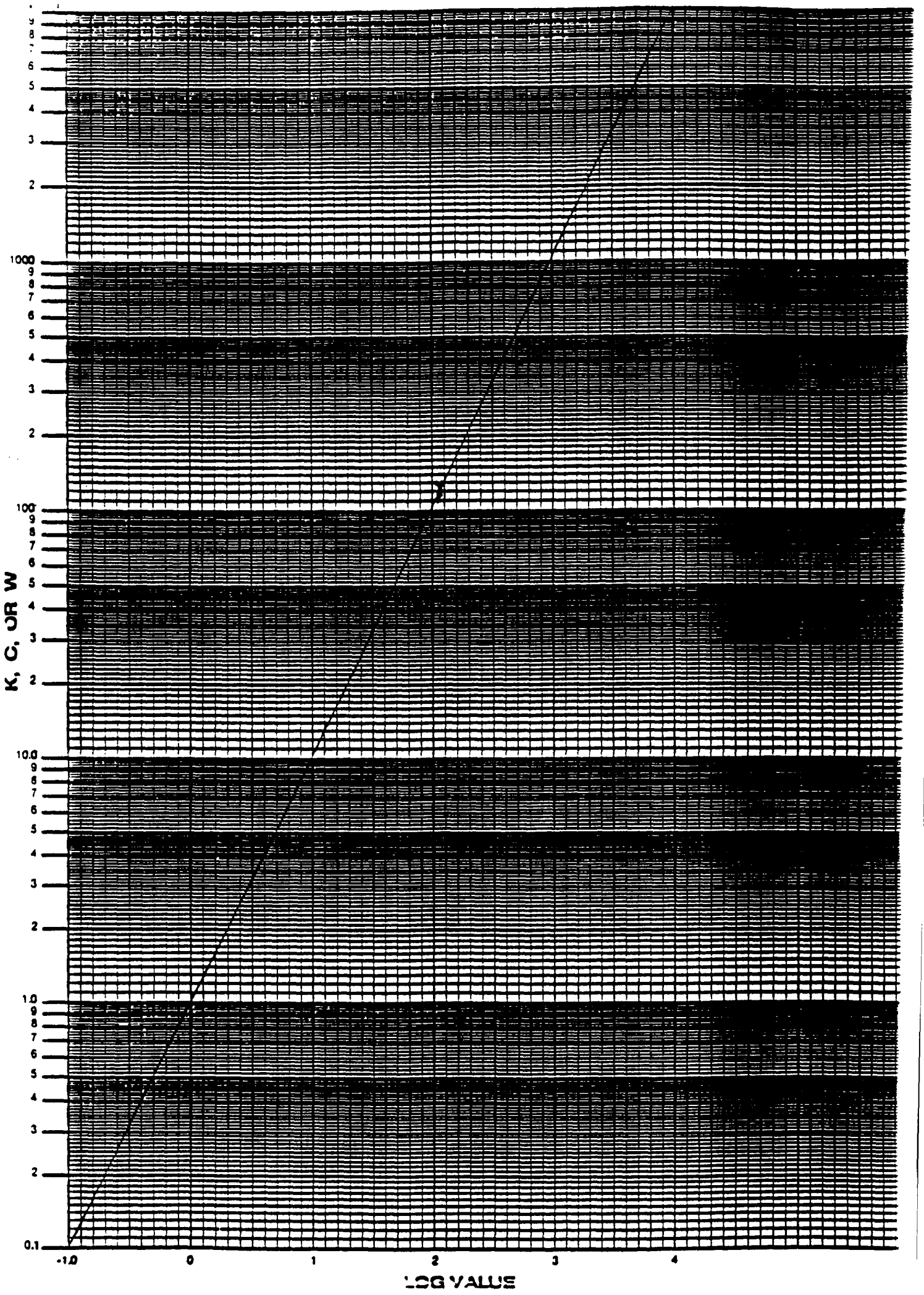
Therefore $\log W = 1.45 + (0.62 \times 1) = 2.07$

Using the log graph, Figure 1, if $\log W = 2.07$ then $W = 120$

(c) Calculate Q

$$Q = 18{,}000 \frac{W}{C}$$

$$= 18{,}000 \times \frac{120}{10} = 216{,}000 \text{ gallons}$$


K, C, OR W
LOG VALUE
0.1
1.0
10.0
100
1000
-1.0
0
1
2
3
4

APPENDIX C-5

GENERATOR WASTE MATERIAL PROFILE SHEET
(GWMPS SHEET)

8

CleanHarbors

ENVIRONMENTAL SERVICES, INC.

Generator's Waste Material Profile Sheet

FOR INTERNAL USE ONLY:
☐ Normal Profile ☐ X-Profile
☐ One Time Waste ☐ Repeat Waste
Fax X-Profiles only to 617-380-3581

CleanHarbors
ENVIRONMENTAL SERVICES, INC.

WASTE MATERIAL PROFILE SHEET

Profile Number CH 214851

A. GENERAL INFORMATION

GENERATOR EPA ID # _____
GENERATOR CODE (Assigned by Clean Harbors) _____ GENERATOR NAME: _____
ADDRESS _____ CITY _____ STATE_____ ZIP_____
GENERATOR TECHNICAL CONTACT: _____ PHONE: _____
CUSTOMER CODE (Assigned by Clean Harbors) _____ CUSTOMER NAME: _____
ADDRESS _____ CITY _____ STATE_____ ZIP_____

B. WASTE DESCRIPTION

Common Name of Waste: _____

Process Generating Waste: _____

Process Generating Waste:
(check one) If spill, origin of spilled material

- ☐ Unused chemical or product
- ☐ Lab Pack
- ☐ Spent halogenated solvents
- ☐ Spent non-halogenated solvents
- ☐ Wastewater treatment sludge from electroplating or etching operations
- ☐ Spent plating bath solutions or residues of plating, stripping and cleaning baths where cyanides are used in the process
- ☐ Wood preservation
- ☐ Inorganic pigment production
- ☐ Organic chemical production
- ☐ Inorganic chemical production
- ☐ Pesticide production
- ☐ Explosives production
- ☐ Petroleum refining
- ☐ Iron or steel production or finishing
- ☐ Primary copper production
- ☐ Primary lead production
- ☐ Primary zinc production
- ☐ Primary Aluminum production
- ☐ Ferro alloy production
- ☐ Secondary lead smelting
- ☐ Veterinary pharmaceutical production
- ☐ Ink formulation
- ☐ Coking
- ☐ Other_____
- ☐ Unknown

Source of Waste:
(check one)

- ☐ Unused Product or Chemical
- ☐ Waste by-product from process
- ☐ Spill clean up
- ☐ Lab Pack
- ☐ Planned site remediation
- ☐ Other:_____

Other Process Information:
(check all that apply)

- ☐ Still bottoms
- ☐ Process scrap
- ☐ Process development
- ☐ Out of date product
- ☐ Spent solvent waste
- ☐ Treatment residues
- ☐ Filter cake
- ☐ Degreasing
- ☐ Exempt recyclable material
- ☐ Packaged consumer goods
- ☐ Off-spec chemical product
- ☐ Zinc, Al, or tin plating
- ☐ Anodizing
- ☐ Cleaning/stripping
- ☐ Wastewater treatment sludges
- ☐ Washwaters
- ☐ Pot liners

Other Process Information:
(check all that apply)

- ☐ Electroplating
- ☐ Conversion coating
- ☐ Carbon steel plating
- ☐ Printed circuit mfg.
- ☐ Cyanide process
- ☐ Heat treating
- ☐ Separator sludge
- ☐ Oven residue
- ☐ Catalyst waste
- ☐ Centrifuged solids
- ☐ Condensate
- ☐ Air, steam, or vacuum stripping
- ☐ Emission control dust
- ☐ Acid leaching
- ☐ Dipping operations
- ☐ Chemical manufacturing
- ☐ Carbon adsorption
- ☐ Incineration or thermal treatment
- ☐ Refining
- ☐ Drug mfg.
- ☐ Distillation
- ☐ Pesticide mfg.
- ☐ Reclamation
- ☐ Etching of metals
- ☐ Bag house dust

Profile Number CH 214851

C. PHYSICAL PROPERTIES (at 25°C or 77°F)

PHYSICAL STATE
- ☐ SOLID WITHOUT FREE LIQUID
- ☐ POWDER
- ☐ MONOLITHIC SOLID
- ☐ LIQUID WITH NO SOLIDS
- ☐ LIQUID/SOLID MIXTURE
  - % FREE LIQUID _____
  - % SETTLED SOLID_____
  - % TOTAL SUSPENDED SOLID _____
- ☐ GAS/AEROSOL

NUMBER OF PHASES/LAYERS
☐ 1 ☐ 2 ☐ 3
% BY VOLUME (APPROX.)
TOP_____ MIDDLE_____ BOTTOM_____

VISCOSITY (If liquid present)
- ☐ LOW (e.g. WATER)
- ☐ MEDIUM (e.g. MOTOR OIL)
- ☐ HIGH (e.g. MOLASSES)

COLOR

ODOR
- ☐ NONE OR MILD
- ☐ STRONG

BOILING POINT (if liquid)
- ☐ ≤ 100°F
- ☐ > 100°F

MELTING POINT (for solids only)
- ☐ < 140°F
- ☐ 140-200°F
- ☐ > 200°F

FLASH POINT
- ☐ < 73°F
- ☐ 73-100°F
- ☐ 101-140°F
- ☐ 141-200°F
- ☐ > 200°F

pH
- ☐ ≤ 2
- ☐ 2.1 - 6.9
- ☐ 7 (neutral)
- ☐ 7.1 - 12.4
- ☐ ≥ 12.5

SPECIFIC GRAVITY
- ☐ < 0.8 (e.g. Gasoline)
- ☐ 0.8-1.0 (e.g. Ethanol)
- ☐ 1.0 (e.g. Water)
- ☐ 1.0-1.2 (e.g. Antifreeze)
- ☐ > 1.2 (e.g. Methylene Chloride)

TOTAL ORGANIC CARBON (If liquid)
- ☐ ≤ 1%
- ☐ 1-9%
- ☐ ≥ 10%

BTU/LB
- ☐ < 2,000
- ☐ 2,000-5,000
- ☐ 5,000-10,000
- ☐ > 10,000

VAPOR PRESSURE (for liquids only)_____ mm Hg

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COMPOSITION (Must add up to at least 100%. Include inert materials and/or debris if applicable. Actual percent or range is acceptable.)

_____	_____	—	_____%	_____	_____	—	_____%
_____	_____	—	_____%	_____	_____	—	_____%
_____	_____	—	_____%	_____	_____	—	_____%
_____	_____	—	_____%	_____	_____	—	_____%
_____	_____	—	_____%	_____	_____	—	_____%

☐ Check if MSDS attached.

E. CONSTITUENTS — Attach any available analysis. Enter values or ranges where known. For TCLP values, BRL signifies below regulatory level. None, unknown, and present are also acceptable answers.

Are these values based on ☐ Knowledge or ☐ Testing?

INORGANIC

RCRA	REGULATED METALS	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL mg/l
D004	ARSENIC	5.0		
D005	BARIUM	100.0		
D006	CADMIUM	1.0		
D007	CHROMIUM	5.0		
D007	CHROMIUM CR+6			
D008	LEAD	5.0		
D009	MERCURY	0.2		
D010	SELENIUM	1.0		
D011	SILVER	5.0		

OTHER METALS	TOTAL
ALUMINUM	
ANTIMONY	
BERYLLIUM	
CALCIUM	
COPPER	
MAGNESIUM	
MOLYBDENUM	
NICKEL	
POTASSIUM	
SILICON	
SODIUM	
THALLIUM	
TIN	
VANADIUM	
ZINC	

NON-METALS	WT%
SULFUR	
BROMINE	
CHLORINE	
FLUORINE	
IODINE	
	PPM
AMMONIA	
REACTIVE SULFIDE	
CYANIDE-TOTAL	
CYANIDE AMENABLE	
CYANIDE REACTIVE	

ORGANIC

VOLATILE COMPOUNDS		REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL mg/l
D018	BENZENE	0.5		
D019	CARBON TETRACHLORIDE	0.5		
D021	CHLOROBENZENE	100.0		
D022	CHLOROFORM	6.0		
D028	1,2-DICHLOROETHANE	0.5		
D029	1,1-DICHLOROETHYLENE	0.7		
D035	METHYL ETHYL KETONE	200.0		
D039	TETRACHLOROETHYLENE	0.7		
D040	TRICHLOROETHYLENE	0.5		
D043	VINYL CHLORIDE	0.2		

SEMI-VOLATILE COMPOUNDS		REGULATORY LEVEL (mg/l)	TCLP	TOTAL
D023	o-CRESOL	200.0		
D024	m-CRESOL	200.0		
D025	p-CRESOL	200.0		
D026	CRESOL (TOTAL)	200.0		
D027	1,4-DICHLOROBENZENE	7.5		
D030	2,4-DINITROTOLUENE	0.13		
D032	HEXACHLOROBENZENE	0.13		
D033	HEXACHLOROBUTADIENE	0.5		
D034	HEXACHLOROETHANE	3.0		
D036	NITROBENZENE	2.0		
D037	PENTACHLOROPHENOL	100.0		
D038	PYRIDINE	5.0		
D041	2,4,5-TRICHLOROPHENOL	400.0		
D042	2,4,6-TRICHLOROPHENOL	2.0		

PESTICIDES AND HERBICIDES		REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL mg/l
D012	ENDRIN	0.02		
D013	LINDANE	0.4		
D014	METHOXYCHLOR	10.0		
D015	TOXAPHENE	0.5		
D016	2,4-D	10.0		
D017	2,4,5-TP (SILVEX)	1.0		
D020	CHLORDANE	0.03		
D031	HEPTACHLOR (AND ITS EPOXIDE)	0.008		

OTHER

PHENOL _____PPM

TOTAL PETROLEUM HYDROCARBONS (SOILS ONLY)_____ PPM

PCB'S
☐ NONE
☐ < 50 PPM
☐ ≥ 50 PPM

IF PCB'S ARE PRESENT <50 PPM, IS THE WASTE REGULATED BY TSCA 40 CFR 761?
☐ YES ☐ NO

HOC'S
☐ NONE
☐ < 1000 PPM
☐ ≥ 1000 PPM

OTHER HAZARDS	YES		YES		YES		YES
WATER REACTIVE	☐	PESTICIDE	☐	SHOCK SENSITIVE	☐	DEA REGULATED SUBSTANCE	☐
RADIOACTIVE	☐	HERBICIDE	☐	THERMALLY SENSITIVE	☐	OXIDIZER	☐
DIOXIN	☐	EXPLOSIVE	☐	INFECTIOUS, PATHOGENIC, OR ETIOLOGICAL AGENT	☐	REDUCING AGENT	☐
OSHA REGULATED CARCINOGENS	☐	SPONTANEOUSLY IGNITES WITH AIR	☐	ASBESTOS	☐	NONE OF THE ABOVE	☐

DOES THIS WASTE HAVE ANY UNDISCLOSED HAZARDS OR PRIOR INCIDENTS ASSOCIATED WITH IT, WHICH COULD AFFECT THE WAY IT SHOULD BE HANDLED? YES ☐ NO ☐ (If yes, explain)

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Profile Number CH 214851

EGULATORY STATUS

N

☐ USEPA HAZARDOUS WASTE? (IF Yes List codes.) _____

☐ ☐ DO ANY GENERATOR STATE WASTE CODES APPLY? IF YES, LIST STATE CODES _____

LIST ANY FEDERAL OR STATE WASTE CODES WHICH MAY VARY FROM SHIPMENT TO SHIPMENT: _____

WILL THE DECISION TO VARY THESE WASTE CODES BE BASED ON ☐ KNOWLEDGE OR ☐ TESTING (check one).
IF KNOWLEDGE, DESCRIBE BASIS OF KNOWLEDGE: _____

☐ ☐ IS THIS WASTE PROHIBITED FROM LAND DISPOSAL WITHOUT FURTHER TREATMENT PER 40 CFR PART 268?
THIS WASTE IS A: ☐ WASTEWATER ☐ NON WASTEWATER PER USEPA DEFINITION IN 40 CFR 268.2.

☐ ☐ IF ANY WASTE CODES D001, D002, D003 (OTHER THAN REACTIVE CYANIDE OR REACTIVE SULFIDE), D004-D011, D012-D017 NON-WASTEWATERS, OR D018-D043 APPLY, ARE THERE ANY UNDERLYING HAZARDOUS CONSTITUENTS (UHC'S) PRESENT ABOVE UNIVERSAL TREATMENT STANDARDS (UTS)?

☐ ☐ DOES TREATMENT OF THIS WASTE GENERATE A F006 OR F019 SLUDGE?

☐ ☐ IS THIS WASTE SUBJECT TO CATEGORICAL PRETREATMENT DISCHARGE STANDARDS?
IF YES, SPECIFY POINT SOURCE CATEGORY LISTED IN 40 CFR PART 401. _____

☐ ☐ IS THIS WASTE REGULATED UNDER THE BENZENE NESHAP RULES? (IS THIS WASTE FROM A CHEMICAL MANUFACTURING, COKE BY-PRODUCT RECOVERY, OR PETROLEUM REFINERY PROCESS?)

☐ ☐ DOES THIS WASTE CONTAIN VOC'S IN CONCENTRATIONS ≥ 500 PPM?

☐ ☐ DOES THIS WASTE CONTAIN GREATER THAN 20% OF ORGANIC CONSTITUENTS WITH A VAPOR PRESSURE ≥ .3KPA (.044 psia)?

☐ ☐ DOES THIS WASTE CONTAIN AN ORGANIC CONSTITUENT WHICH IN ITS PURE FORM HAS A VAPOR PRESSURE GREATER THAN 77 KPa (11.2psia)?

G. D.O.T. INFORMATION: List all shipping names that may be used. Attach additional page if necessary.

D.O.T. SHIPPING NAME _____

_____ DOT HAZARD CLASS: _____

UN/NA # _____ PACKING GROUP (Circle 1) I II III HAZARD ZONE (Circle 1) A B C D

WILL THIS SHIPPING NAME VARY? ☐ Y ☐ N IF YES, WILL ASSIGNMENT OF PROPER SHIPPING NAME BE BASED ON ☐ KNOWLEDGE OR ☐ TESTING? (check one) IF KNOWLEDGE, DESCRIBE BASIS OF KNOWLEDGE: _____

TRANSPORTATION REQUIREMENTS

ESTIMATED SHIPMENT FREQUENCY: ☐ ONE TIME ☐ WEEKLY ☐ SEMI-MONTHLY ☐ MONTHLY ☐ QUARTERLY ☐ OTHER _____

☐ BULK LIQUID

GALLONS/SHIPMENT: _____GAL.
_____ FROM TANKS: TANK SIZE _____GAL.
_____ FROM DRUMS
VEHICLE TYPE:
_____ VAC TRUCK
_____ TANK TRUCK
_____ RAILROAD TANK CAR
CHECK COMPATIBLE STORAGE MATERIALS:
_____ STEEL ___STAINLESS STEEL (316)
_____ RUBBER LINED ___FIBERGLASS LINED
_____ OTHER _____

☐ BULK SOLD

_____TON/YD PER SHIPMENT
STORAGE CAPACITY _____TON/YD
VEHICLE TYPE:
_____ DUMP TRAILER
_____ ROLL OFF BOX
_____ INTERMODAL ROLLOFF BOX
_____ CUSCO/VACTOR
_____ OTHER _____

☐ CONTAINERIZED

_____CONTAINERS/SHIPMENT
STORAGE CAPACITY: _____ CONTAINERS
CONTAINER TYPE:
_____ CUBIC YARD BOX
_____ PALLET
_____ TOTE TANK
_____ DRUM SIZE: _____
CONTAINER MATERIAL:
_____ STEEL
_____ FIBER
_____ PLASTIC
_____ OTHER _____

I. SAMPLE STATUS

REPRESENTATIVE SAMPLE HAS BEEN SUPPLIED. ☐ YES ☐ NO SAMPLED BY _____ DATE SAMPLED _____

J. SPECIFIC DISPOSAL RESTRICTIONS OR REQUESTS: _____

SPECIAL WASTE HANDLING REQUIREMENTS: _____

OTHER COMMENTS OR REQUESTS: _____

K. BIENNIAL/ANNUAL REPORTING INFORMATION.

SIC CODE _____ SOURCE CODE _____ FORM CODE _____ ORIGIN CODE _____

GENERATOR'S CERTIFICATION

I hereby certify that all information submitted in this and attached documents is correct to the best of my knowledge. I also certify that any samples submitted are representative of the actual waste. If Clean Harbors discovers a discrepancy during the approval process, Generator grants Clean Harbors the authority to d the profile, as Clean Harbors deems necessary, to reflect the discrepancy.

AUTHORIZED SIGNATURE	NAME (PRINT)	TITLE	DATE

FOR CLEAN HARBORS USE ONLY

CHI REPRESENTATIVE COMPLETING PROFILE: _____

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Chemical Services Division

safety-kleen.

SK REFERENCE NO: _____

MATERIAL PROFILE

Safety-Kleen (SK) Use Only	If applicable, Intercompany Billing Facility #	Customer Number:	SK Line Of Business #:	Facility Profile #:

A. GENERATOR INFORMATION ☐ *Check if Billing Information is same as Generator Information*

Generator Name _____ Billing Company _____

Facility Address (No P.O. Box) _____ Billing Address _____

City/State/Zip _____ City/State/Zip _____

Technical Contact _____ Billing Contact _____

Phone _____ Fax _____ Phone _____ Fax _____

E-mail _____ *Generator Location (if different from above)* _____

SIC/NAIC: _____ ☐ CESQG ☐ SQG US EPA ID# _____ State Generating ID# _____

B. SHIPPING INFORMATION ☐ *DOT Assistance Requested* ☐ *Check if SK Transportation Services are requested*

US DOT Proper Shipping Name

Technical Constituent(s)

Hazard Class / Division # _____ ID # (UN / NA) _____ Packing Group (PG) _____ RQ _____

Non-Bulk Shipping Containers					Bulk Shipping Containers	
Size	Steel	Poly	Fiber	Quantity & Frequency	Container Type	Quantity, Size & Frequency
____ Gal	☐	☐	☐	_____	☐ Yd.³ Box or ☐ Super Sack	_____
____ Gal	☐	☐	☐	_____	☐ Hard Top or ☐ Tarped Bin	_____
____ Gal	☐	☐	☐	_____	☐ End Dump (Tarped) Trailer	_____
____ Gal	☐	☐	☐	_____	☐ Tank or ☐ Vacuum Trailer	_____

C. GENERAL MATERIAL & REGULATORY INFORMATION

Name of Material _____

Process Generating The Material _____

Odor: ☐ None ☐ Mild ☐ Strong; Describe _____

Yes	No		Yes	No	
☐	☐	Regulated or Licensed Radioactive Waste	☐	☐	Meets LDR Standards or ☐ Partially Meets (Landfill Only)
☐	☐	Regulated Medical / Infectious Waste	☐	☐	Commingled Waste (2 or more hazardous wastes mixed as one)
☐	☐	Regulated Benzene NESHAP Waste	☐	☐	Sorbent Added; If Yes, is sorbent biodegradable? ☐ Yes ☐ No
☐	☐	TSCA Regulated PCB Waste (List any PCB level in Sec.D)	☐	☐	Exempt Waste; If Yes, list reference, 40 CFR _____
☐	☐	Regulated Subpart CC Waste (VOs ≥ 500 ppm)	☐	☐	State Hazardous Waste; State Code: _____
☐	☐	Regulated Ozone Depleting Substance	☐	☐	EPA Hazardous Waste
☐	☐	CERCLA Regulated (Superfund) Waste			EPA Waste Codes (including any LDR treatment, e.g., D003 Water Reactive):
☐	☐	Hazardous Debris (Subject to alternate LDR treatment standards)			_____
☐	☐	Waste Contains UHCs/Constituents of Concern			_____
		If yes, list in ☐ Sec. D or ☐ Constituent Addendum			_____

EPA Haz Waste Only Origin Code ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 Source Code: _____ Form Code: _____ Mgmt Method: _____

D. MATERIAL COMPOSITION

1. Chemical/Physical Constituents: List all detectable components by chemical name, including physical material, e.g., sorbent, debris.

Material Components & Composition	ppm	☐ wt % ☐ vol %	Material Components & Composition	ppm	☐ wt % ☐ vol %

Section D continues on the next page for Elemental Constituents → Range Total ≥ = 100%

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SAFETY-KLEEN MATERIAL PROFILE (continued): **SK REFERENCE NO:** _____

Note: Completion of Section D.2 & F is optional for: ☐ Analytical Profile (representative sample submitted; test results used to complete D.2 & F)
Completion of Sections D.2, E, & F is optional for: ☐ Standard Industry Profile (Safety-Kleen historical data utilized to complete D.2, E, & F)

D. MATERIAL COMPOSITION *(Continued)*

2. **Elemental Constituents** ☐ *Check if this waste contains No Detectable Elements / Metals, unless listed below.*

Check either; ☐ Total Analysis or ☐ TCLP Method or ☐ Generator Knowledge, then enter data below.

Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent	ppm	Constituent	ppm
Aluminum		Cadmium		Fluorine		Nickel		Sodium	
Antimony		Chlorine		Lead		Phosphorous		Sulfur	
Arsenic		Chromium		Lithium		Potassium		Thallium	
Barium		Cobalt		Manganese		Selenium		Tinnium	
Beryllium		Copper		Mercury		Silicon		Vanadium	
Bromine		Iodine		Molybdenum		Silver		Zinc	

E. REACTIVE CHARACTERISTICS ☐ *Check if this waste exhibits No Reactive Characteristics*

Yes	No		Yes	No		Yes	No		
☐	☐	Explosive	☐	☐	Oxidizer	☐	☐	Reactive Cyanide	ppm
☐	☐	Shock Sensitive	☐	☐	Water Reactive	☐	☐	Reactive Sulfide	ppm
☐	☐	Pyrophoric	☐	☐	Air Reactive	☐	☐	Polymerizable	

Other Incompatibles; Describe _____

F. MATERIAL PHYSICAL CHARACTERISTICS @ 70° F.

# of Phases	Color	Flash Point _____ °F (if < 73°F)	pH ☐ Liquids > 20% H_2O or pH ☐ Non-Aqueous
Liquid %	Specific Gravity	☐ 73 - < 100°F ☐ 100 - 141°F	☐ ≤ 2 pH ☐ > 2 - 4 pH ☐ > 4 - 10 pH
Sludge %	Viscosity cps	☐ 142° F. - < 200° F ☐ ≥ 200°F	☐ > 10 - < 12.5 pH ☐ ≥ 12.5 pH
Solid %	Density ☐ lbs/ gal. ☐ lbs/ cu. ft.	Boiling Point (if < 130°F)	BTU/ lb. or Range
Powder %		Ash % (Bridgeport Only)	
Gas %	Comments		

G. GENERATOR PROFILE CERTIFICATION

I hereby certify that I am an authorized agent of the generator, and warrant on behalf of the generator that the information supplied on this form and on any attachments or supplements hereto is complete and accurate, and that all known or suspected hazards of the material(s) described herein have been disclosed. I agree that if the sample test results indicate a discrepancy with any information supplied on this form, then either Safety-Kleen or the generator may initiate further testing and evaluation in accordance with the terms and conditions of the contract between Safety-Kleen and the generator and that this profile certification may be amended accordingly.

_____ _____ ____/____/____

Generator's Authorized Signature — Name & Title (Printed or Typed) — Date

Comments _____

SK Use Only ☐ SKQS ☐ SKVS ☐ Non-Haz Evaluation ☐ Standard Industry Profile SIP Index # _____

SK Sales Rep. Name _____ Employee # _____ Territory Branch # _____

Process Approval # _____ Product Code or Part # _____ TRI Flowpath # _____ Pricing _____

Waste Approval & Certification

We certify acceptability of this waste stream and that all appropriate permits have been obtained, as indicated by Safety-Kleen's facility approval below:

_____ _____ ____/____/____

SK Authorized Facility Signature — Name & Title (Printed or Typed) — Date

APPENDIX C-6

CONTAINER STORAGE COMPATIBILITY TEST PROCEDURES
[REVISED 09/17/93]

A. General Considerations

1. A compatibility test shall be conducted during CHCI's conformance testing procedures and prior to placement of any container into a storage bay.

2. Solids and lab packs are exempt from the sampling and compatibility test procedures.

3. At a minimum, one (1) sample per generator waste stream shall be tested for compatibility.

4. A new composite sample shall be created for each storage bay at least once per month.

B. Composite Sample Preparation

1. One (1) composite sample shall be prepared and maintained for each storage bay. The composite container shall be 1-liter in size.

2. Initially, at least 10 ml of each waste stream placed into a storage bay will be placed into the one liter composite container. The minimum composite sample volume shall be 0.5 liters.

3. When a 1-liter composite container is full, one-half of the composite sample (0.5 liters) shall be removed to begin a new composite sample.

4. A new composite container will be started anytime the storage bay is completely empty, or contains only lab packs or solid drums.

C. Compatibility Test Procedures

1. On a weekly basis, a 100 ml aliquot from the storage bay composite shall be retrieved.

2. To test for compatibility, a 5 ml sample from the 100 ml aliquot shall be mixed with a 5 ml sample from the candidate waste stream. The mixture shall be observed for any sign of incompatibility (e.g., exothermic reaction, evolution of gas, etc.).

3. If the mixture is deemed to be compatible:

   a. A 5 ml portion of the 10 ml aliquot-candidate mixture shall be added to the weekly 100 ml aliquot to prepare for the next compatibility test;

   b. A 10 ml of the candidate waste stream will be added to the weekly composite sample; and

   c. The candidate waste stream will be approved for storage in the designated storage bay.

4. If the mixture is deemed to be incompatible:

   a. The 10 ml aliquot-candidate mixture will be placed into a suitable container for proper treatment/disposal with other laboratory-generated wastes;

   b. The facililty shall identify possible alternate storage bay(s), as available, and perform a new compatibility test; and

   c. If a suitable alternate storage bay is not identified, other suitable waste management options such as direct pumping to bulk storage/treatment units or rejection to an alternate facility will be considered.

5. The results of each compatibility test shall be documented in the existing laboratory report forms.

Clean Harbors of Chicago's laboratory is equipped to perform the analytical tests discussed in the waste analysis plan.

The facility has a 2000 square feet fully equipped laboratory. The major equipment includes:

Two (2) Perkin-Elmer Model 3030B Atomic Absorption Spectrophotometer

Hewlett-Packard Model 5890 Series II GC equipped with ECD, FID, 3396 Integrator, and 7273A Autosampler.

Waters Model Dimension I Gas Chromatograph equipped with PID and HECD, Dual 745D Data Modules, interfaced with a Tekmar Model LSC 2000 Automatic Purge and Trap.

Dohrmann Model DX-20B Total Halogen Analyzer equipped with DX-20A Absorption Module for determination of Total Organic Halides.

Miscellaneous Equipment: Rotary extractor, Pensky Martens Closed-cup Flash point tester, distillation apparatus, centrifuges, waterbaths, balances. pH and ORP meters, oxygen bombs.

In addition to the facility's laboratory, Clean Harbors of Chicago, Inc. may utilized Clean Harbors Analytical Services, Inc (CHAS) in Bedford, MA or other qualified testing laboratory. CHAS has all the capabilities of the plant laboratory and, in addition, it has the following equipment for some specialized analyses:

Inorganic Chemistry Instrumentation

Perkin-Elmer Plasma II Emission Spectrometer with autosampler and computer.

Jarrell-Ash Model 855 Inductively Coupled Argon Plasma Spectrometer (ICPS), interfaced to a solid state controller board with IBM PS/2 computer for data aquisition and analysis, with software updated to match the Jarrell Ash model 6100.

Perkin - Elmer Model 2380 Atomic Absorption Spectrometer.

Technicon Random Access Automated Chemistry System (TRAACS) 800.

Varian Model 21 Nephelometer.

Technicon Auto Analyzer II system.

Varian Model DMS 80 Ultraviolet Visible Spectrometer.

Dohrmann DC-80 Total Organic Carbon (TOC) Analyzer.

Electronic microbalance--Mettler ME22 with BA25 autotare.

Four Mettler analytical balances.

A variety of Orion electrodes.

Mixer/mill sample homogenizer--Spex Indusries.

YSI Model 31 conductivity bridge.

Perkin-Elmer Model 5100 graphite furnace atomic absorption spectrometer.

Miscellaneous equipment such as muffle furnaces, drying ovens, oxygen bombs, digestion bombs, and a shakerbath.

Support equipment such as power supplies, frequency counters, oscilloscopes, etc.

Organic Chemistry Instrumentation

Hewlett-Packard 5985 GC/MS/Data Systems (2 units). Both units are equipped with autosamplers and can be equipped with the Tekmar LSC-2 Liquid Sample concentrators for purge-and-trap analysis of samples of various matrices. The units are capable of utilizing computer algorithms which will compare unknown spectra to the NBS/EPA/NIH Mass Spectral Data Base for identification of unknown compounds.

Tekmar LSC-3 Automated Liquid Sampler.

Hewlett Packard 5970B Mass Selective Detector with stand alone GC and turbo pump. The MSD interfaces directly with Clean Harbors'RTE data system and includes a capillary direct interface for the HP5890 GC, an ion gauge controller, remote start capability, capillary inlet system for split/splitless operation including two flow controllers for total flow and septum purge, and an auto sampler.

Two(2) Hewlett-Packard model 1000 series computer systems with RTE-6/VM operating systems.

Deltec Power Conditioner.

Tekmar 4210 Purge and Trap Autosampler for VOST and TO-1 analyses.

Tekmar 4200 Purge and Trap Autosampler for heated purge and trap soils.

HP RTE Rev E Data System--The two HP 5985 mass spectrometers and 5970B MSD are operated by an RTE Rev-E Data System that controls the mass spectrometers for selected ion monitoring to a high level of sophistication, and allows for the rapid off-line analysis of the data generated. This system automates the calculation of calibation curves, mass spectral library searches, and the quantitation of samples. The off-line feature of RTE manipulates the data generated without affecting the operating status of the mass spectrometers, thus greatly increasing sample throughput.

Hewlett-Packard 3350S Laboratory Automation System--this system is comprised of hardware and software designed to operate on an HP-1000 series minicomputer running the RTE-A operating system. The system provides direct communications to various analytical instrumentation in the laboratory. Through the use of A.D. modules, the raw data is collected exclusive of operator interface directly to the main system. The 3350S system software offers facilities to perform final data handling from calculation to report. In addition, this system provides tracking of all samples from receipt through analysis and reporting.

Hewlett-Packard 5880 Processing Gas Chromatograph with a 7672 automatic sample injector. Data manipulation is performed using a microprocessor interfaced with the instrument.

Three (3) Hewlett Packard 5890 Processing Gas Chromatograph with a 7673 automatic sample injectors.

Perkin-Elmer Model 3920B Gas Chromatrograph is a dual-column modular instrument equipped with both flame ionization and electron capture detectors.

Chromalytics 1047 Concentrator.

Digital Micro VAX 2 computer system.

Dohram DX-29 Total halogens and TOX analyzer.

APPENDIX C-8

LAND DISPOSAL RESTRICTION FORMS
(CLEAN HARBORS ENVIRONMENTAL SERVICES INC FORMS: LDR, LDR1, LDR-LP)

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.
LAND DISPOSAL RESTRICTION NOTIFICATION FORM LDR-1 Manifest No. _____

THE HAZARDOUS WASTES IDENTIFIED ON THE HAZARDOUS WASTE MANIFEST IDENTIFIED ABOVE AND BEARING THE EPA HAZARDOUS WASTE CODES LISTED BELOW ARE RESTRICTED WASTES WHICH ARE PROHIBITED FROM LAND DISPOSAL WITHOUT FURTHER TREATMENT UNDER THE LAND DISPOSAL RESTRICTIONS, 40 CFR PART 268 AND RCRA SECTION 3004(D). IN ACCORDANCE WITH 40 CFR 268.7(a)(2), THE EPA WASTE CODE, WASTE SUBCATEGORY, AND TREATABILITY GROUPS, AS APPLICABLE, ARE INCLUDED BELOW.

INSTRUCTIONS -- COMPLETE ALL SECTIONS. REFER TO PAGE 3 OF THIS FORM FOR KEY TERMS/DEFINITIONS.

Column 1 - Line Item: Enter the manifest line item number (e.g., 11a) that corresponds to the waste code(s).

Column 2 - Waste Codes/Subcategory: Check off all applicable waste codes. For D001 through D043, also check applicable subcategory; for F001 through F005, check applicable constituents.

Column 3 - Wastewater/Non-wastewater: Check off "WW" for wastewater and "Non-WW" for non-wastewaters.

Column 4 - LDR Handling Code: Circle the appropriate handling code, as follows:

1 = The waste is a characteristic hazardous waste D001, D002, D003, D004-D011, or D018-43 which is intended for treatment/disposal in a CWA system, CWA-equivalent system, or Class I SDWA system. Underlying Hazardous Constituents (UHC's) are NOT required to be identified.

1A = The waste is a characteristic hazardous waste D001 High TOC Ignitable Liquids Subcategory (i.e., greater than or equal to 10% TOC). Pursuant to 40 CFR 268.40, the waste must be treated using organic recovery (RORGS) or combustion (CMBST) technology. UHC's are NOT required to be identified.

2 = The waste is a characteristic hazardous waste D001 (other than High TOC Ignitable Liquids), D002, D003 Explosive, Water Reactive or Other Reactive subcategory, D004-D011, D012-17 non-wastewater, or D018-43 which is intended for treatment/disposal in a non-CWA system, non-CWA-equivalent system, or non-Class I SDWA system located in the United States. All UHC's which are reasonably expected to be present must be identified, except for D001 waste that is intended to be treated using organic recovery (RORGS) or combustion (CMBST) technologies. Identify UHC's by completing Sections I and IV of CHI Form LDR-1 Addendum and attach completed Addendum to this form.

3 = The waste is a characteristic (i.e., D-code) or listed (i.e., F-, K-, U-, or P-code) hazardous waste which is intended for export and treatment/disposal at a facility located outside the United States. LDR treatment standards do not apply to hazardous waste treated/disposed in a foreign country, and per USEPA guidance, the identification of UHC's (if applicable) is not required for hazardous waste that is intended to be exported. Note however that if the exported waste is subsequently returned for treatment/disposal in the United States, all applicable LDR regulations would apply and a revised LDR notification would be required.

4 = The waste meets the definition of hazardous debris pursuant to 40 CFR 268.2(h) and is intended for treatment/disposal in compliance with the alternate debris treatment technologies of 40 CFR 268.45. In accordance with the requirements of 40 CFR 268.7(a)(2): the contaminants subject to treatment (CSTT's) must be identified as part of this notification. Identify CSTT's by completing Sections III and IV of CHI Form LDR-1 Addendum and attach completed Addendum to this form. These constituents are being treated to comply with 40 CFR 268.45.

5 = The waste is a characteristic waste D003 Reactive Sulfide, Reactive Cyanide, or Unexploded Ordnance subcategory, a characteristic waste D012-17 wastewater, or a listed (i.e., F-, K-, U-, or P-code) hazardous waste. UHC's are NOT required to be identified.

6 = The waste is a lab pack that is intended for incineration using the alternative lab pack treatment standard under 40 CFR 268.42(c). UHC's are NOT required to be identified; however, the generator must complete and attach the lab pack certification statement on CHI Form LDR-LP. Note that in accordance with 40 CFR Part 268 Appendix IV, lab packs which contain waste codes D009, F019, K003, K004, K005, K006, K062, K071, K100, K106, P010, P011, P012, P076, P078, U134, and U151 are not eligible for alternative lab pack treatment standard.

*** NOTE: IF THE WASTE IS A SOIL CONTAMINATED WITH A LISTED OR CHARACTERISTIC WASTE AND THE GENERATOR WANTS TO USE THE ALTERNATE TREATMENT STANDARD FOR SOILS, CONTACT CORPORATE COMPLIANCE FOR THE APPROPRIATE LDR NOTIFICATION FORM.

SECTION I. CHARACTERISTIC WASTES D001 THROUGH D043

COLUMN 1. LINE ITEM SEE MANIFEST	COLUMN 2. WASTE CODE / SUBCATEGORY			COLUMN 3 WASTEWATER/ NON-WASTEWATER	COLUMN 4: HANDLING CODE
_____	[ ]	D001	Ignitables, except High TOC subcategory	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ]	D001	High TOC Ignitable Liquids Subcategory (Greater than or equal to 10% TOC)	[ ] Non-WW only	1A 3 6
_____	[ ]	D002	Corrosives	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ]	D003			
		[ ]	Reactive Sulfide, per 261.23(a)(5)	[ ] WW [ ] Non-WW	1 3 4 5 6
		[ ]	Reactive Cyanide, per 261.23(a)(5)	[ ] WW [ ] Non-WW	1 3 4 5 6
		[ ]	Explosive, per 261.23(a)(6), (7) & (8)	[ ] WW [ ] Non-WW	1 2 3 4 6
		[ ]	Water Reactive, per 261.23(a)(2), (3) & (4)	[ ] Non-WW only	1 2 3 4 6
		[ ]	Other Reactive, per 261.23(a)(1)	[ ] WW [ ] Non-WW	1 2 3 4 6
		[ ]	Unexploded Ordnance, Emergency Response	[ ] WW [ ] Non-WW	1 3 4 5 6
_____	[ ]	D004	Arsenic	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ]	D005	Barium	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ]	D006			
		[ ]	Cadmium	[ ] WW [ ] Non-WW	1 2 3 4 6
		[ ]	Cadmium Containing Batteries	[ ] Non-WW only	2 3 6
_____	[ ]	D007	Chromium	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ]	D008			
		[ ]	Lead	[ ] WW [ ] Non-WW	1 2 3 4 6
		[ ]	Lead Acid Batteries	[ ] Non-WW only	2 3 6

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.
LAND DISPOSAL RESTRICTION NOTIFICATION FORM LDR-1

Manifest No. _____

SECTION I. CHARACTERISTIC WASTES D001-43 (CONTINUED)

COLUMN 1: LINE ITEM SEE MANIFEST	COLUMN 2: WASTE CODE / NAME	COLUMN 3: WASTEWATER/ NON-WASTEWATER	COLUMN 4: HANDLING CODE
_____	[ ] D009		
	[ ] Low Mercury, less than 260 mg/kg Mercury	[ ] WW [ ] Non-WW	1 2 3 4
	[ ] High Mercury Organic Subcategory	[ ] Non-WW only	2 3 4
	[ ] High Mercury Inorganic Subcategory	[ ] Non-WW only	2 3 4
_____	[ ] D010 Selenium	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D011 Silver	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D012 Endrin	[ ] WW [ ] Non-WW	2 3 4 5 6
_____	[ ] D013 Lindane	[ ] WW [ ] Non-WW	2 3 4 5 6
_____	[ ] D014 Methoxychlor	[ ] WW [ ] Non-WW	2 3 4 5 6
_____	[ ] D015 Toxaphene	[ ] WW [ ] Non-WW	2 3 4 5 6
_____	[ ] D016 2,4-D	[ ] WW [ ] Non-WW	2 3 4 5 6
_____	[ ] D017 2,4,5-TP (Silvex)	[ ] WW [ ] Non-WW	2 3 4 5 6
_____	[ ] D018 Benzene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D019 Carbon tetrachloride	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D020 Chlordane	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D021 Chlorobenzene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D022 Chloroform	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D023 o-Cresol	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D024 m-Cresol	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D025 p-Cresol	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D026 Cresol	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D027 1,4-Dichlorobenzene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D028 1,2-Dichloroethane	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D029 1,1-Dichloroethylene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D030 2,4-Dinitrotoluene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D031 Heptachlor (and its epoxide)	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D032 Hexachlorobenzene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D033 Hexachlorobutadiene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D034 Hexachloroethane	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D035 Methyl ethyl ketone	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D036 Nitrobenzene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D037 Pentachlorophenol	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D038 Pyridine	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D039 Tetrachloroethylene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D040 Trichloroethylene	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D041 2,4,5-Trichlorophenol	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D042 2,4,6-Trichlorophenol	[ ] WW [ ] Non-WW	1 2 3 4 6
_____	[ ] D043 Vinyl Chloride	[ ] WW [ ] Non-WW	1 2 3 4 6

SECTION II. SPENT SOLVENT WASTES F001 THROUGH F005

COLUMN 1: LINE ITEM SEE MANIFEST	COLUMN 2: WASTE CODE / CONSTITUENTS	COLUMN 3: WASTEWATER/ NON-WASTEWATER	COLUMN 4: HANDLING CODE
_____	[ ] F001 [ ] F002 [ ] F003 [ ] F004 [ ] F005	[ ] WW [ ] Non-WW	3 4 5 6

_____ [ ] 1. ALL F001-F005
_____ [ ] 2. Acetone
_____ [ ] 3. Benzene
_____ [ ] 4. n-Butyl alcohol
_____ [ ] 5. Carbon disulfide
_____ [ ] 6. Carbon tetrachloride
_____ [ ] 7. Chlorobenzene
_____ [ ] 8. o-Cresol
_____ [ ] 9. m-Cresol (difficult to distinguish from p-cresol)
_____ [ ] 10. p-Cresol (difficult to distinguish from m-cresol)
_____ [ ] 11. Cresol - mixed isomers (sum of o-, m- and p-cresol)
_____ [ ] 12. Cyclohexanone
_____ [ ] 13. o-Dichlorobenzene
_____ [ ] 14. 2-Ethoxyethanol (F005 only)
_____ [ ] 15. Ethyl acetate
_____ [ ] 16. Ethyl benzene
_____ [ ] 17. Ethyl ether
_____ [ ] 18. Isobutyl alcohol
_____ [ ] 19. Methanol
_____ [ ] 20. Methylene chloride
_____ [ ] 21. Methyl ethyl ketone
_____ [ ] 22. Methyl isobutyl ketone
_____ [ ] 23. Nitrobenzene
_____ [ ] 24. 2-Nitropropane (F005 only)
_____ [ ] 25. Pyridine
_____ [ ] 26. Tetrachloroethylene
_____ [ ] 27. Toluene
_____ [ ] 28. 1,1,1-Trichloroethane
_____ [ ] 29. 1,1,2-Trichloroethane
_____ [ ] 30. Trichloroethylene
_____ [ ] 31. 1,1,2-Trichloro-1,2,2-trifluoroethane
_____ [ ] 32. Trichloromonofluoromethane
_____ [ ] 33. Xylene - mixed isomers (sum of o-, m-, and p-xylene)

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.
LAND DISPOSAL RESTRICTION NOTIFICATION FORM LDR-1 Manifest No. _____

SECTION III. CALIFORNIA LIST WASTES

COLUMN 1: LINE ITEM SEE MANIFEST	COLUMN 2: WASTE CODE / SUBCATEGORY	COLUMN 3: WASTEWATER/ NON-WASTEWATER	COLUMN 4: HANDLING CODE
_____	Hazardous waste containing one or more of the following California List constituents:	[ ] WW [ ] Non-WW	1 2 3 4 5 6

[ ] ALL CALIFORNIA LIST CONSTITUENTS
[ ] Liquids with nickel greater than or equal to 134 mg/l
[ ] Liquids with thallium greater than or equal to 130 mg/l
[ ] Liquids with PCB's > or = 50 ppm
[ ] Waste containing HOC's > or = 1,000 mg/kg

SECTION IV. OTHER LISTED WASTES (F006-12, F019-F028, F037-38, F039, K-, U-, AND P-CODES)

COLUMN 1: LINE ITEM SEE MANIFEST	COLUMN 2: WASTE CODE / SUBCATEGORY	COLUMN 3: WASTEWATER/ NON-WASTEWATER	COLUMN 4: HANDLING CODE
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6
_____	_____	[ ] WW [ ] Non-WW	3 4 5 6

[ ] CHECK HERE IF ADDITIONAL LISTED WASTE CODES ARE PRESENT. COMPLETE AND ATTACH LDR-1 CONTINUATION SHEET.
[ ] CHECK HERE IF WASTE CODE F039 (MULTISOURCE LEACHATE) IS PRESENT. IDENTIFY F039 CONSTITUENTS BY COMPLETING SECTIONS II AND IV OF CHI FORM LDR-1 ADDENDUM AND ATTACH COMPLETED ADDENDUM TO THIS FORM.

SECTION V. CONTACT NAME AND DATE

Print Name: _____ Date: _____

KEY TERMS/DEFINITIONS

CLASS I SDWA SYSTEM means a Class I deep well facility regulated under the Safe Drinking Water Act (SDWA).

CWA SYSTEM means a centralized wastewater treatment facility discharging under a Clean Water Act (CWA) permit. For example, a CWA facility would treat organic or inorganic aqueous wastes and discharge the treated effluent to the local sewer system. Examples of CWA treatment systems owned and operated by Clean Harbors include the wastewater treatment operations at Baltimore (including the CES system), Bristol, Chicago, Cincinnati and Cleveland.

CWA-EQUIVALENT SYSTEM means a "zero discharge system" that engages in "CWA-equivalent" treatment before land disposal. Zero-discharge facilities treat hazardous wastes using "CWA-equivalent" treatment methods, but do not discharge the treatment effluent to a sewer or water body (e.g., spray irrigation land farm). "CWA-equivalent" treatment methods means biological treatment for organics, alkaline chlorination, or ferrous sulfate precipitation for cyanide, precipitation/ sedimentation for metals, reduction of hexavalent chromium, or other treatment technology that can be demonstrated to perform equally or greater than these technologies.

HIGH TOC IGNITABLE LIQUIDS SUBCATEGORY means an ignitable liquid hazardous waste (waste code D001) which contains greater than or equal to 10% total organic carbon (TOC). Pursuant to 40 CFR 268.40, such wastes must be treated using organic recovery (RORGS) or combustion (CMBST) technology. Examples of RORGS technologies include the CES unit at Clean Harbors of Baltimore. Examples of CMBST technologies include hazardous waste fuel blending and subsequent reuse at a cement kiln, or destruction at a RCRA incinerator.

WASTEWATERS are wastes that contain less than 1% by weight total organic carbon (TOC) and less than 1% by weight total suspended solids (TSS). [See 40 CFR 268.2(f)]

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.
LAND DISPOSAL RESTRICTION NOTIFICATION FORM LDR-LP
LAB PACK ALTERNATIVE TREATMENT STANDARD CERTIFICATION

Manifest No. _____

SECTION I. WASTE CODES ELIGIBLE FOR ALTERNATIVE TREATMENT STANDARD

[ ] Check here if the lab pack contains only those hazardous wastes codes which are NOT listed in 40 CFR Appendix IV (see Key Terms below), and which is intended for incineration in accordance with the alternative treatment standard in 40 CFR 268.42(c). If checked, complete the lab pack certification statement in Section II.

[ ] Check here if the lab pack contains one or more hazardous waste codes identified in 40 CFR Part 268 Appendix IV (see Key Terms below). If checked, the lab pack IS NOT eligible for the alternative lab pack treatment standard.

SECTION II. GENERATOR CERTIFICATION AND SIGNATURE (REQUIRED)

I CERTIFY UNDER PENALTY OF LAW THAT I PERSONALLY HAVE EXAMINED AND AM FAMILIAR WITH THE WASTE AND THAT THE LAB PACK CONTAINS ONLY WASTES THAT HAVE NOT BEEN EXCLUDED UNDER APPENDIX IV TO 40 CFR PART 268 AND THAT THIS LABPACK WILL BE SENT TO A COMBUSTION FACILITY IN COMPLIANCE WITH THE ALTERNATIVE TREATMENT STANDARDS FOR LABPACKS AT 40 CFR 268.42(c). I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING A FALSE CERTIFICATION, INCLUDING THE POSSIBILITY OF FINE OR IMPRISONMENT.

Authorized Signature: _____ Date: _____

KEY TERMS/DEFINITIONS

LAB PACK means waste materials classed as US DOT Class or Division 3, 4.1, 4.2, 4.3, 5.1, 6.1, 8, or 9. Outer packaging must be either open head steel, aluminum, fiber, plastic or plywood drum, meeting at least packing group III performance levels. Each outer packaging must contain only one class of hazardous material. Inner containers may be glass not exceeding 1 gallon capacity, or metal or plastic not exceeding 5.3 gallons capacity. Gross weight of the container may not exceed 452 pounds. Inner packagings containing liquids must have sufficient absorbent material to absorb all liquid contents. [See 49 CFR 172.13]

PART 268 APPENDIX IV means the following waste codes identified in 40 CFR 268 Appendix IV which are not eligible for treatment using the alternative lab pack treatment standard in 40 CFR 268.42(c): D009, F019, K003, K004, K005, K006, K062, K071, K100, K106, P010, P011, P012, P076, P078, U134, and U151.

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.
CONTINUATION SHEET FOR USE WITH
LAND DISPOSAL RESTRICTION NOTIFICATION FORM LDR-1

Manifest No. _____

SECTION V. OTHER LISTED WASTES (F006-12, F019-F028, F037-38, F039, K-, U-, AND P-CODES)
CONTINUED FROM PAGE 3 OF FORM LDR-1

COLUMN 1: LINE ITEM SEE MANIFEST	COLUMN 2: WASTE CODE / SUBCATEGORY	COLUMN 3: WASTEWATER/ NON-WASTEWATER		COLUMN 4: HANDLING CODE
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6
		[ ] WW	[ ] Non-WW	3 4 5 6

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.
LAND DISPOSAL RESTRICTION NOTIFICATION FORM LDR-1 ADDENDUM Manifest No._____

SECTION I. UNDERLYING HAZARDOUS CONSTITUENTS (UHC'S)

[ ] Check here if one or more of the constituents listed in Section IV below are reasonably expected to be present as an "Underlying Hazardous Constituent" in the waste. Then in Section IV, check off each constituent. Note that per the definition of UHC in 40 CFR 268.2, fluoride, selenium, sulfides, vanadium and zinc are NOT regulated as UHC's.

[ ] Check here if NONE of the UHC constituents listed in Section IV are expected to be present in the waste.

SECTION II. MULTI-SOURCE LEACHATE (WASTE CODE F039)

[ ] Check here if one or more of the constituents listed in Section IV are present as a constituent in the multi-source leachate (F039) waste. Then in Section IV below, check off each constituent. Note that constituents which are identified by an asterisk (*) are NOT regulated as F039 constituents.

[ ] Check here if NONE of the F039 constituents listed in Section IV are present in the waste.

SECTION III. HAZARDOUS DEBRIS CONTAMINANTS SUBJECT TO TREATMENT (CSTT)

[ ] Check here if one or more of the constituents listed in Section IV is a CSTT for hazardous debris that is intended for treatment using the alternate treatment technologies in 40 CFR 268.45. To identify CSTT's, refer to the "Regulated Hazardous Constituent" column in the Treatment Standard Table in 40 CFR 268.40. Then, in Section IV below, check off the constituents that appear for each waste code used to identify the debris.

[ ] Check here if the entry in the "Regulated Hazardous Constituent" column in the Treatment Standard Table in 40 CFR 268.40 is "Not Applicable", i.e. D001, D002, and D003 (non-cyanides subcategories only).

SECTION IV. LIST OF CONSTITUENTS - INCLUDE MANIFEST LINE ITEM

34.____ [ ] Acenaphthylene
35.____ [ ] Acenaphthene
36.____ [ ] Acetone
37.____ [ ] Acetonitrile
38.____ [ ] Acetophenone
39.____ [ ] 2-Acetylaminofluorene
40.____ [ ] Acrolein
41.____ [ ] Acrylamide (*)
42.____ [ ] Acrylonitrile
251.____ [ ] Aldicarb sulfone (*)
43.____ [ ] Aldrin
44.____ [ ] 4-Aminobiphenyl
45.____ [ ] Aniline
46.____ [ ] Anthracene
47.____ [ ] Antimony
48.____ [ ] Aramite
49.____ [ ] Arsenic
50.____ [ ] alpha-BHC
51.____ [ ] beta-BHC
52.____ [ ] delta-BHC
53.____ [ ] gamma-BHC
252.____ [ ] Barban (*)
54.____ [ ] Barium
253.____ [ ] Bendiocarb (*)
255.____ [ ] Benomyl (*)
55.____ [ ] Benzene
56.____ [ ] Benz(a)anthracene
57.____ [ ] Benzal chloride (*)
58.____ [ ] Benzo(b)fluoranthene (difficult to distinguish from Benzo(k)fluoranthene)
59.____ [ ] Benzo(k)fluoranthene (difficult to distinguish from Benzo(b)fluoranthene)
60.____ [ ] Benzo(g,h,i)perylene
61.____ [ ] Benzo(a)pyrene
62.____ [ ] Beryllium
63.____ [ ] Bromodichloromethane
64.____ [ ] Bromomethane (Methyl bromide)
65.____ [ ] 4-Bromophenyl phenyl ether
66.____ [ ] n-Butyl alcohol
256.____ [ ] Butylate (*)
67.____ [ ] Butyl benzyl phthalate
68.____ [ ] 2-sec-Butyl-4,6-dinitrophenol (Dinoseb)
69.____ [ ] Cadmium
257.____ [ ] Carbaryl (*)
258.____ [ ] Carbendazim (*)
259.____ [ ] Carbofuran (*)
260.____ [ ] Carbofuran phenol (*)
70.____ [ ] Carbon disulfide
71.____ [ ] Carbon tetrachloride
261.____ [ ] Carbosulfan (*)
72.____ [ ] Chlordane (alpha and gamma isomers)
73.____ [ ] p-Chloroaniline
74.____ [ ] Chlorobenzene
75.____ [ ] Chlorobenzilate
76.____ [ ] 2-Chloro-1,3-butadiene
77.____ [ ] Chlorodibromomethane
78.____ [ ] Chloroethane
79.____ [ ] bis(2-Chloroethoxy)methane
80.____ [ ] bis(2-Chloroethyl)ether
81.____ [ ] Chloroform
82.____ [ ] bis(2-Chloroisopropyl)ether
83.____ [ ] p-Chloro-m-cresol
84.____ [ ] 2-Chloroethyl vinyl ether (*)
85.____ [ ] Chloromethane (Methyl Chloride)
86.____ [ ] 2-Chloronaphthalene
87.____ [ ] 2-Chlorophenol
88.____ [ ] 3-Chloropropylene
89.____ [ ] Chromium (Total)
90.____ [ ] Chrysene
91.____ [ ] o-Cresol
92.____ [ ] m-Cresol (difficult to distinguish from p-Cresol)
93.____ [ ] p-Cresol (difficult to distinguish from o-Cresol)
262.____ [ ] m-Cumenyl methylcarbamate (*)
94.____ [ ] Cyanides (Total)
95.____ [ ] Cyanides (Amenable)
263.____ [ ] Cycloate (*)
96.____ [ ] Cyclohexanone
97.____ [ ] 1,2-Dibromo-3-chloropropane
98.____ [ ] 1,2-Dibromoethane (Ethylene dibromide)
99.____ [ ] Dibromomethane
100.____ [ ] 2,4-Dichlorophenoxyacetic acid (2,4-D)
101.____ [ ] o,p'-DDD
102.____ [ ] p,p'-DDD
103.____ [ ] o,p'-DDE
104.____ [ ] p,p'-DDE
105.____ [ ] o,p'-DDT
106.____ [ ] p,p'-DDT
107.____ [ ] Dibenz(a,h)anthracene
108.____ [ ] Dibenzo(a,e)pyrene
109.____ [ ] m-Dichlorobenzene
110.____ [ ] o-Dichlorobenzene
111.____ [ ] p-Dichlorobenzene

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112. _____ [ ] Dichlorodifluoromethane
113. _____ [ ] 1,1-Dichloroethane
114. _____ [ ] 1,2-Dichloroethane
115. _____ [ ] 1,1-Dichloroethylene
116. _____ [ ] trans-1,2-Dichloroethylene
117. _____ [ ] 2,4-Dichlorophenol
118. _____ [ ] 2,6-Dichlorophenol
119. _____ [ ] 1,2-Dichloropropane
120. _____ [ ] cis-1,3-Dichloropropylene
121. _____ [ ] trans-1,3-Dichloropropylene
122. _____ [ ] Dieldrin
123. _____ [ ] Diethyl phthalate
124. _____ [ ] 2,4-Dimethyl phenol
125. _____ [ ] Dimethyl phthalate
126. _____ [ ] Di-n-butyl phthalate
127. _____ [ ] 1,4-Dinitrobenzene
128. _____ [ ] 4,6-Dinitro-o-cresol
129. _____ [ ] 2,4-Dinitrophenol
130. _____ [ ] 2,4-Dinitrotoluene
131. _____ [ ] 2,6-Dinitrotoluene
132. _____ [ ] Di-n-octyl phthalate
133. _____ [ ] p-Dimethylaminoazobenzene (*)
134. _____ [ ] Di-n-propylnitrosoamine
135. _____ [ ] 1,4-Dioxane (*)
136. _____ [ ] Diphenylamine (difficult to distinguish from
137. _____ [ ] Diphenylnitrosamine (difficult to distinguish from
diphenylamine)
138. _____ [ ] 1,2-Diphenylhydrazine
139. _____ [ ] Disulfoton
268. _____ [ ] Dithiocarbamates (Total) (*)
140. _____ [ ] Endosulfan I
141. _____ [ ] Endosulfan II
142. _____ [ ] Endosulfan sulfate
143. _____ [ ] Endrin
144. _____ [ ] Endrin aldehyde
267. _____ [ ] EPTC (*)
145. _____ [ ] Ethyl acetate
146. _____ [ ] Ethyl cyanide (propanenitrile)
147. _____ [ ] Ethyl benzene
148. _____ [ ] Ethyl ether
149. _____ [ ] bis(2-Ethylhexyl)phthalate
150. _____ [ ] Ethyl methacrylate
151. _____ [ ] Ethylene oxide
152. _____ [ ] Famphur
153. _____ [ ] Fluoranthene
154. _____ [ ] Fluorene
155. _____ [ ] Fluoride
268. _____ [ ] Formetanate hydrochloride (*)
156. _____ [ ] Heptachlor
157. _____ [ ] Heptachlor epoxide
158. _____ [ ] Hexachlorobenzene
159. _____ [ ] Hexachlorobutadiene
160. _____ [ ] Hexachlorocyclopentadiene
161. _____ [ ] HxCDDs (All hexachlorodibenzo-p-dioxins)
162. _____ [ ] HxCDFs (All hexachlorodibenzo-furans)
163. _____ [ ] Hexachloroethane
164. _____ [ ] Hexachloropropylene
165. _____ [ ] Indeno (1,2,3-c,d)pyrene
270. _____ [ ] 3-Iodo-2-propynyl n-butylcarbamate (*)
166. _____ [ ] Iodomethane
167. _____ [ ] Isobutyl alcohol
168. _____ [ ] Isodrin
169. _____ [ ] Isosafrole
170. _____ [ ] Kepone
171. _____ [ ] Lead
172. _____ [ ] Mercury--Nonwastewater from Retort
173. _____ [ ] Mercury--All others
174. _____ [ ] Methacrylonitrile
175. _____ [ ] Methanol
176. _____ [ ] Methapyrilene
272. _____ [ ] Methiocarb (*)
273. _____ [ ] Methomyl (*)
177. _____ [ ] Methoxychlor
178. _____ [ ] 3-Methylcholanthrene
179. _____ [ ] 4,4-Methylene-bis(2-chloroaniline)
180. _____ [ ] Methylene chloride
181. _____ [ ] Methyl ethyl ketone
182. _____ [ ] Methyl isobutyl ketone
183. _____ [ ] Methyl methacrylate
184. _____ [ ] Methyl methansulfonate
185. _____ [ ] Methyl parathion
274. _____ [ ] Metolcarb (*)
275. _____ [ ] Mexacarbate (*)
276. _____ [ ] Molinate (*)
186. _____ [ ] Naphthalene
187. _____ [ ] 2-Naphthylamine
188. _____ [ ] Nickel
189. _____ [ ] o-Nitroaniline (*)
190. _____ [ ] p-Nitroaniline
191. _____ [ ] Nitrobenzene
192. _____ [ ] 5-Nitro-o-toluidine
193. _____ [ ] o-Nitrophenol (*)
diphenylnitrosamine)
194. _____ [ ] p-Nitrophenol
195. _____ [ ] N-Nitrosodiethylamine
196. _____ [ ] N-Nitrosodimethylamine
197. _____ [ ] N-Nitroso-di-n-butylamine
198. _____ [ ] N-Nitrosomethylethylamine
199. _____ [ ] N-Nitrosomorpholine
200. _____ [ ] N-Nitrosopiperidine
201. _____ [ ] N-Nitrosopyrrolidine
277. _____ [ ] Oxamyl (*)
202. _____ [ ] Parathion
203. _____ [ ] Total PCBs (sum of all PCB isomers, or all Arochlors)
278. _____ [ ] Pebulate (*)
204. _____ [ ] Pentachlorobenzene
205. _____ [ ] PeCDDs (All pentachlorodibenzo- p-dioxins)
206. _____ [ ] PeCDFs (All pentachlorodibenzofurans)
207. _____ [ ] Pentachloroethane (*)
208. _____ [ ] Pentachloronitrobenzene
209. _____ [ ] Pentachlorophenol
210. _____ [ ] Phenacetin
211. _____ [ ] Phenanthrene
212. _____ [ ] Phenol
213. _____ [ ] Phorate
214. _____ [ ] Phthalic acid (*)
215. _____ [ ] Phthalic anhydride
280. _____ [ ] Physostigmine (*)
281. _____ [ ] Physostigmine salicylate (*)
282. _____ [ ] Promecarb (*)
216. _____ [ ] Pronamide
283. _____ [ ] Propham (*)
284. _____ [ ] Propoxur (*)
285. _____ [ ] Prosulfocarb (*)
217. _____ [ ] Pyrene
218. _____ [ ] Pyridine
219. _____ [ ] Safrole
220. _____ [ ] Selenium
221. _____ [ ] Silver
222. _____ [ ] Silvex (2,4,5-TP)
223. _____ [ ] Sulfide
224. _____ [ ] 2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)
225. _____ [ ] 1,2,4,5-Tetrachlorobenzene
226. _____ [ ] TCDDs (All tetrachlorodibenzo- p-dioxins)
227. _____ [ ] TCDFs (All tetrachlorodibenzofurans)
228. _____ [ ] 1,1,1,2-Tetrachloroethane
229. _____ [ ] 1,1,2,2-Tetrachloroethane
230. _____ [ ] Tetrachloroethylene

231. _____ [ ] 2,3,4,6-Tetrachlorophenol
232. _____ [ ] Thallium
286. _____ [ ] Thiodicarb (*)
287. _____ [ ] Thiophanate-methyl (*)
233. _____ [ ] Toluene
234. _____ [ ] Toxaphene
289. _____ [ ] Triallate (*)
235. _____ [ ] Tribromomethane (Bromoform)
236. _____ [ ] 1,2,4-Trichlorobenzene
237. _____ [ ] 1,1,1-Trichloroethane
238. _____ [ ] 1,1,2-Trichloroethane
239. _____ [ ] Trichloroethylene
240. _____ [ ] Trichloromonofluoromethane
241. _____ [ ] 2,4,5-Trichlorophenol
242. _____ [ ] 2,4,6-Trichlorophenol
243. _____ [ ] 1,2,3-Trichloropropane
244. _____ [ ] 1,1,2-Trichloro-1,2,2-trifluoroethane
290. _____ [ ] Triethylamine (*)
245. _____ [ ] tris-(2,3-Dibromopropyl)phosphate
246. _____ [ ] Vanadium (*)
291. _____ [ ] Vernolate (*)
247. _____ [ ] Vinyl chloride
248. _____ [ ] Xylenes--mixed isomers (sum of o-, m-, and p-xylene concentrations)
249. _____ [ ] Zinc (*)

KEY TERMS/DEFINITIONS

CONTAMINANTS SUBJECT TO TREATMENT (CSTT) are the specific constituents listed by waste code number in the Treatment Standard Table in §268.40. CSTT's must be identified for all hazardous debris wastes that are intended for treatment using one of the hazardous debris alternate treatment technologies described in §268.45.

REASONABLY EXPECTED TO BE PRESENT means that the generator is relying on knowledge of the raw materials used, the process, and potential reaction products, or on the results of a one-time analysis for the entire list of UHC's that may be present in the untreated hazardous waste. If a one-time analysis of the entire list of UHC's is conducted, subsequent analyses are required for only those pollutants which would reasonably be expected to be present in the waste as generated, based on the previous sampling and analysis results.

UNDERLYING HAZARDOUS CONSTITUENT (UHC) means any constituent listed in §268.48 Table UTS - Universal Treatment Standards (except fluoride, selenium, sulfides, vanadium and zinc) which can reasonably be expected to be present at the point of generation of the hazardous waste, at a concentration above the constituent-specific UTS treatment standard. [See 40 CFR 268.2]

APPENDIX D-1

PROCESS DESCRIPTIONS FOR EXISTING AND PROPOSED ACTIVITIES AT CLEAN HARBORS SERVICES, INC.

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1.0 WASTEWATER TREATMENT SYSTEM

1.1 Chemical Precipitation, Coagulation and Filtration

CHSI accepts aqueous-based hazardous and non-hazardous wastewater for onsite treatment. Incoming bulk wastes are, following conformance testing according the facility's Waste Analysis Plan, are offloaded into one of four 7,000-gallon receiving tanks. The wastewater is then pumped into the bulk mix tank for storage and testing prior to treatment.

A sample of waste from the mix tank will be bench tested to determine the best treatment method. This bench treatment method will then be replicated in the chemical treatment unit by reproducing those treatment conditions on the bulk waste stream.

The chemical treatment unit consists of four front chambers each with a mixing pump below and a top mixer above. This allows the appropriate residence time for proper mixing of the waste and treatment chemicals. Wastewater is pumped through the treatment feed pump into the first chamber with Sodium Hydroxide or Lime Slurry to precipitate Metal Hydroxides. All treatment chemicals are added as solutions to increase mixing efficiencies. The wastewater mixes to a uniform pH previously determined by bench testing to provide the best treatment. The wastewater then flows through each chamber in the treatment unit by gravity. In the second chamber the wastewater is mixed with Aluminum Sulfate to affect the coagulation of heavy metals and fats, oils, and greases. Again the wastewater is mixed to the appropriate pH. In the third chamber the wastewater is mixed with Sodium Sulfide to precipitate Metal Sulfides. This is a polishing step because of the lower solubilities of Metal Sulfides in water than Metal Hydroxides. In the fourth chamber the wastewater is mixed with various polymers to affect flocculation of the precipitated heavy metals. The wastewater than flows to the back chamber called the flocculation chamber. This chamber consists of three slowly turning floc paddles designed to help agglomerate the solids for faster settling during the clarification stage.

The wastewater flows by gravity through a splitter box to equalize the flow through four clarifiers called gravitators. These gravitators have an internal piping arrangement, which allows the wastewater to go through a velocity decrease due to an increase in retention time. This velocity decrease allows solids to settle into the cone bottom of each gravitator while the clarified effluent goes through the overflow lines at the top of each gravitator. To remove solids from the gravitators, timed, dump valves release the under flow to the floor pit. The underflow contains more water than desired for dewatering because all the solids (precipitated metals) must be removed from the clarified effluent. The underflow is approximately 4 percent total solids. The solids from the floor pit are pumped to the sludge concentrator, tank #3.

Clarified effluent will flow by gravity to a collection tank or secondary clarification. The collection tank collects Effluent, which needs secondary treatment. The collection tank is necessary due to the uneven flow from the gravitators caused by underflow dumping. When the collection tank is full, the secondary treatment system is energized. A transfer pump pumps the Effluent to the mezzanine level where three tanks with mixers are located. The retreated Effluent flows by gravity though each tank with chemical Precipitants, Coagulants, and Flocculates for the specific treatment necessary. This pretreatment of the Clarified Effluent allows increased treatment due solubility differences of metal at pH values. Different metals will have the lowest solubility in water at different pH levels. If metals were precipitated at a high pH in the chemical treatment unit and the solids (metals) separated form the Effluent; the metals can not resolubilize when retreated at a lower pH. The metals, which have lower solubilites at a lower pH value, will precipitate out in the secondary treatment system. This double treatment allows the most efficient removal of metals from the wastewater.

The treated effluent flows by gravity to the Effluent box for secondary clarification. This includes an underflow section to remove floating solids, solids settling through Lamella tube settlers, and an automatic pumping section which pumps to the effluent storage tank, Tank #1. Solids removed from the effluent box dump into the floor pit.

Samples are drawn at different points throughout the treatment system to determine that treatment is running efficiently. Adjustments are made as necessary.

When the effluent tank is full, the effluent is re-sampled to check the constituents against discharge parameters. If the discharge parameters are met, the Effluent is discharged through a flume for flow measurement and composite sampling and pumped to the Chicago Metropolitan Water Reclamation District's Calumet treatment plant. Effluent not meeting discharge parameters is pumped back to a mix tank for re-treatment.

Sludge from the floor pit is pumped to the center of the sludge concentrator. The residence time allows a clarified overflow from the top of the tank to gravity flow back to a receiving pit, and the material is retreated. Concentrated sludge of approximately 8 percent total solids are pumped to one of two sludge conditioning tanks. These tanks have internal mixers to keep the sludge homogeneous and allow the mixing of treatment chemicals. Lime slurry and polymers are added for reflocculation and stabilization of the sludge. The conditioned sludge is pumped to an overhead plate and frame filter press. The press consists of recessed plates covered with filter cloths. At the start of the cycle the press is empty and the pressure drop across the press is low. Sludge pumps through quickly with solids caught between the cloths and filtrate passing through to receiving pit #1. The segregated filtrate is collected, pH adjusted, and retested for discharge parameters. Filtrate meeting discharge parameters is pumped to the effluent discharge tank. Filtrate not meeting discharge parameters is pumped to the mix tank for retreatment. As the cycle progresses solids increase between the cloths and the pressure drop increases across the press.

Smaller amounts of sludge can be pumped through the press over equal time periods, but the total solids of the filtercake increases. At the end of the cycle the pump is stopped, pressure is taken off the plates, and an automatic plate shifter separates the plates allowing the filtercake to fall directly into a dump trailer. A light curtain protects the press operator from injury during filtercake discharge. Each dump trailer is sampled and tested to assure the filtercake is non-hazardous prior to shipment to a non-hazardous landfill.

During times of high solids loading or tank cleanouts, a mobile plate and frame filter press will be utilized to prevent solids overloading of the treatment system.

Certain waste streams high in solids may be pumped directly to the sludge concentrator of sludge conditioning tanks for de-watering only.

1.1.2 Pretreatment

In many cases the wastes received would require a pretreatment before they could be mixed with other waste material and then subjected to the primary treatment method so that the final products obtained would be acceptable to either the local sewer system or the sludge disposal site. These pretreatment methods would include neutralization, chemical oxidation, chemical reduction, and oil recovery.

The reactor system includes three reactors. Reactor #1 has an acid and an alkaline packed tower scrubber and is used for small bulk shipments, containerized waste, or lab pack materials. Reactor #1 is a lined steel vessel with its own mixer. Reactors #2 and #3 are single compartment fiberglass tanks each with a packed tower scrubber. They each have cooling coils and are connected to a cooling tower for heat removal. The diversity in tanks makes the plant capable of handling all types of pretreatment waste. Wastes, which require pretreatment, would be unloaded into a receiving pit and pumped to a reactor, or unloaded directly to a reactor.

Certain hazardous waste types must be neutralized before being mixed with other wastes and subjected to primary treatment. After receipt, these materials would be neutralized using an appropriate neutralizing agent. Acids would be neutralized with Sodium Hydroxide or Lime Slurry. Alkalines would be neutralized with Sulfuric Acid; Aluminum Sulfate, or Ferric Chloride. K062 pickle liquors will be lime neutralized to render the residue non-hazardous. After neutralization, these materials would be pumped to the mixing tank or to the sludge-conditioning tank for de-watering.

Certain hazardous waste types must be oxidized before being mixed with other wastes and subjected to primary treatment. After receipt these materials would be oxidized using an appropriate oxidizing agent. Phenol wastes are oxidized with Hydrogen Peroxide. Cyanide wastes are oxidized with Hydrogen Peroxide. Sulfide wastes are oxidized with Hydrogen Peroxide. Hazardous waste streams containing organic Toxicity Characteristic (TC) codes (D018-D043) will be oxidized with Potassium Permanganate or Hydrogen Peroxide until the TC characteristic is removed. Other wastes may need oxidation for odor control. After oxidation, these materials would be pumped to the mixing tank or to the sludge-conditioning tank for de-watering.

Certain hazardous waste types must be reduced before being mixed with other wastes and subjected to primary treatment. After receipt these materials would be reduced using an appropriate reducing agent. Hexavalent Chromium would be treated with Sodium Bisulfite and the Sulfur Dioxide would reduce the waste to Trivalent Chromium. Hexavalent Chromium does not readily precipitate during primary treatment while Trivalent Chromium will. After reduction, these materials would be pumped to the mixing tank or to the sludge-conditioning tank.

Certain waste types will need other pretreatment before being mixed with other wastes and subjected to primary treatment. Ammoniated wastes are also subject to pretreatment because they chelate metals, which would prevent the metals from precipitating out of solution. Ammoniated wastes would be pH adjusted to high pH levels so the ammonia could freely release or be air stripped from the waste. Other wastes have chelation chemicals added to dissolve the metals into the waste, such as boiler cleanout material. These chelated materials will be broken down through neutralizations, oxidation, and reduction as necessary. Other wastes may need certain treatment chemicals added for pretreatment to increase the treatability of the waste. Pretreatment chemical used include Sodium Hydroxide, Lime Slurry, Aluminum Sulfate, Sodium Sulfide, Sulfuric Acid, Ferric Chloride, Sodium Bisulfite, Hydrogen Peroxide, Potassium Permanganate, Polymers, and other treatment chemicals, Certain catalysts may also be needed to start the reaction with Ferrous Sulfate as an example.

Chemicals are added as a solution to increase the reaction rate. After pretreatment, these materials would be pumped to the mixing tank or to the sludge-conditioning tank for de-watering.

The scrubbers are adapted to use a Sodium Hydroxide or a Sulfuric Acid solution as the scrubbing medium. Concentrated Sulfuric Acid can be diluted through the fiberglass acid dilution tanks attached to the system. Air sparred into the reactors and outside air pulled in from the blower system is pulled through the scrubber for each reactor. When a scrubber is in the acid operation mode, the scrubber will capture ammonia emitted during pretreatment. Ammonium Sulfate is produced and stored in a separate fiberglass tank prior to discharge to the sanitary district. Caustic scrubber water is appropriately pretreated before pumping to the Mix Tank for primary treatment.

The inorganic lab pack pour-off area is located on a platform above Reactor #1. This area is also used for cylinder downloading. Cylinders of certain inorganic materials are downloaded into the reactor for treatment. The area has containment and a pour-off lab hood and sink. Inorganic lab packs are unpacked in the appropriate storage area into box pallets (i.e., gondolas). The box pallet is moved to the inorganic lab pack pour off area. Lab packs are poured into the sinks, which flow into Reactor #1. A water rinse is available during pour-off and empty containers are rinsed before disposal. Reactor #1 is partially filled with water prior to labpack pour off to provide a heat sink as the materials are poured in. After pour-off, the waste is sampled and analyzed. The waste is appropriately pretreated before pumping to the mix tank for primary treatment. The Lab pack de-pack guidelines are listed in attachment 1.

1.2 Oil Recovery System

The oil recovery system consists of two 6000 gallon oil reactors, a 6000 gallon oil collection tank, and 6000 gallon cuff collection tank. This system has its own containment. Non hazardous oily wastes received in bulk or containers can be unloaded into a receiving pit and pumped to an oil reactor or unloaded directly to an oil reactor. Separation of oil from the aqueous material is achieved with adjustment of pH to 2 with Sulfuric Acid, heating the waste to 140 degrees F with steam, and addition of Demulsifying Agents. After separation, water is decanted and pumped to the mix tank for primary treatment. Oil is pumped to the oil collection tank and cuff to the cuff collection tank. The oil reactor tanks are vented to a carbon absorption system. Bulk shipments and containers with substantial oil volumes may also be pumped to directly to the oil collection tank or cuff collection tank. Oil and cuff are shipped offsite for appropriate reuse as a fuel substitute, oil re-use or for disposal

1.3 Container Storage, Consolidation and Transfer

CHSI accepts hazardous and non-hazardous wastes for storage, consolidation, onsite treatment, and/or transfer to approved offsite waste management facilities. CHSI receives wastes in containers such as 55-gallon drums and lab packs.

Upon arrival at the facility, incoming drums are staged and sampled in accordance with the conformance-testing program outlined in the facility's Waste Analysis Plan. Accepted wastes are stored in containers in the container storage area (Unit G1) located inside building No. 2 or the existing outside container storage area (Units R1 & R2). Building #2 is used to manage up to 552 55-gallon (equivalent) drums in three segregated storage bays and a drum staging area. The storage bays manage acidic and alkaline waste. In addition, there is a drum staging area for 72 drums. The existing outside container storage area is used to manage 1,136 55-gallon (equivalent) drums in segregated storage bays for flammables, poisons, reactive, and oxidizers, including two drum staging areas.

Following acceptance, drummed waste is processed by several methods, including:

1. Acid and alkaline waste is consolidated and treated on-site, or used as a substitute for "virgin" treatment chemicals in the "treatment" process;

2. The waste may be shipped in its original container for offsite treatment and/or disposal, or;

3. The waste may be blended into substitute fuels or;

4. The contents of the container will be transferred into a tank truck, roll-off container (i.e., solids) or other container and then shipped to an offsite treatment or disposal facility.

The plant shall manage the drummed materials according to the directions of the laboratory. If the drummed materials are to be "bulked" a record shall be kept of the materials which were pumped into a particular tank of transport vehicle with a notation being made of the manifest which accompanied that particular load.

As each drum is treated, a notation of the date that, that particular drum was treated shall be made on the Receiving Report.

CHSI also operates two additional drum storage buildings (Building 25, Building 26) and a container receiving dock/staging area (Unit 61).

2.0 PART B ACTIVITIES

2.1 Expanded Container Storage, Consolidation and Transfer

CHSI has constructed an approved expanded outdoor container storage area (Unit R2). This area allows for the storage of 1,296 55-gallon drums. The Outdoor Drum Storage area has nine separate storage bays to ensure that potentially incompatible materials are not stored in the same area. In addition, the area includes two container staging areas and two loading/unloading docks for receiving and shipping containers. CHSI also has approval to operate a lab pack storage building (Unit U), paint and paint related material storage area (Unit 42), and shredder and metal wash staging/storage operations in Units 24 & 68.

Containerized waste stored at the facility are to be subject to process operation such as: onsite treatment; consolidation and transfer; hazardous waste fuels blending; hazardous waste shredding; metal washing; and drum crushing and compaction. These process activities are described in detail below.

2.2 Container Crushing and Compaction

CHSI is approved to construct a Container Crushing and Compaction Unit. Only drums and containers deemed RCRA empty would be crushed and compacted. The crusher is elevated to allow crushed drums to fall into the roll-off container located on the pad next to the crusher. Empty drums and containers will be continuously fed into the crusher. After crushing and compaction, the drums will be shipped offsite to an appropriate facility. The drum crusher will also be used for compaction of safety equipment (e.g., protective clothing) from waste activities. In addition, a shredder will be used to shred poly containers which will not crush easily. The proposed drum crushing and compaction operation is included in CHCI Drawing No. 4212.

2.3 Bulking Operation – Tank Farm and Railcars

The tank farm (Unit 16) consists of 10 tanks (nine 12,800-gallon and one 19,800-gallon) for fuel blending/shredding Each tank is equipped with a mixer to keep waste material in the tank homogenous. Waste materials pumped to the storage tanks will include bulk waste from trucks or railcars and bulking of containerized waste. Bulk wastes can be loaded or unloaded on the bulk tank truck pad (Unit 15) located next to the storage area. Bulk waste can also be loaded or unloaded from the storage area. Bulk waste can also be loaded or unloaded from the railcar loading/unloading area (Unit 13), which is equipped with secondary containment system. For construction details see CHSI DWG. #4217. Containerized wastes can also be bulked into these tanks from the drum pumping stations in Unit 26 and Unit 61. Only compatible wastes will be pumped to storage tanks from trucks, rail cars or containers. Wasted pumped to trucks must be compatible with the material the trucks or railcars are constructed of. Only compatible wastes will be bulked from containers to trucks or rail cars. All materials will be tested for compatibility prior to pumping using the "bucket test" or equivalent procedure described in the facility's Waste Analysis Plan. All wasted to be shipped offsite will be tested for the ultimate disposal sites requirements prior to shipment to that facility.

2.3.1 Bulking Operation – Tank Farm

CHSI is approved to construct a Hazardous Waste Tank Farm. The tank farm will consist of eight 11,025 gallon tanks for listed and non-listed wastes; and 4 tanks (two 10,558-gallon, one 15,547-gallon and one 6,136-gallon) for hazardous waste shredding. Each tank will be equipped with a mixer to keep waste material in the tank homogenous. Waste materials pumped to the storage tanks will include bulk waste from trucks and bulking of containerized waste. Of the eight listed/non-listed waste tanks, three will be used for storage of waste to be transferred offsite, three for storage of waste to be transferred to the listed waste treatment system in Building #3, and two for treated effluent storage. Bulk wastes can be loaded or unloaded on the bulk tank truck pads (Unit X & Unit 69) located next to the storage areas. Bulk waste can also be loaded or unloaded from the storage areas or the container transfer area using vacuum trucks. There is also a truck bulking area in the container storage area in which trucks can be loaded from a storage tank or from containers. Only compatible wastes will be pumped to storage tanks from trucks or containers. Wasted pumped to trucks must be compatible with the material the trucks are constructed of. Only compatible wastes will be bulked from containers to trucks. All materials will be tested for compatibility prior to pumping using the "bucket test" or equivalent procedure described in the facility's Waste Analysis Plan. All wasted to be shipped offsite will be tested for the ultimate disposal sites requirements prior to shipment to that facility.

2.4 Listed Waste/Organic Treatment Process

CHSI is approved to construct a Listed Waste/Organic Treatment Process. The listed waste/organic treatment process will be located in Building #3. Wastes treated in the system will be pumped from the waste storage tank farm, directly from bulk trucks or from containers in the container staging/consolidation areas using vacuum trucks.

The treatment process is a flexible system, which can utilize multiple pieces of equipment as required for treatment. The system includes a 13,570-gallon reactor for batch treatment. The reactor has a packed tower scrubber capable of an acid or alkaline scrubbing medium. The reactor is also equipped with a cooling coil, which has its own cooling tower for the heat removal. The system includes a lamella clarifier which is used to separate materials into liquid and higher solid content sludge's. A plate and frame filter press is included for dewatering of material. The system included a sand filter to remove fine particulate and a carbon column for removal of organic compounds by adsorption. This system also included two 11,025-gallon effluent storage tanks.

Wastes pumped to the reactor will be treated batch basis according to the treatment required. This could include neutralization, oxidation, reduction, air stripping, chelation breaking, chemical precipitation, coagulation, flocculation, or other appropriate treatment. Certain reactive wastes (such as cyanide or sulfide bearing wastes) will be stored in the waste storage tank farm and/or treated in the reactor. If the wastes are stored in the tank farm, they will be segregated from all other acidic wastestreams. No other waste stream with a pH of less than eight will be stored in the same tank. Compatibility testing is done for all waste prior to co-mingling to assure no reaction will occur. Reactive wastes will be pumped to the reactor for treatment directly from the tanker or from the tank farm. Treatment of cyanide or sulfide bearing wastes will be accomplished by addition of hydrogen peroxide to oxidize those constituents.

During cyanide or sulfide oxidation, the packed tower scrubber will utilize an alkaline scrubbing medium. The reactor will be operated at a slight negative pressure so emissions will be vented through the scrubber. After oxidation, additional treatments may be necessary depending on the waste constituents. After batch treatment, the material will be pumped to one of the following operations:

- The Lamella clarifier when the waste needs clarification of the liquid phase and concentration of the sludge phase.
- The plate and frame filter press when the waste is concentrated enough for dewatering.
- The sand filter when the waste requires fine particulate removal.

Wastes can be pumped to the Lamella clarifier from the reactor or direct unloading from trucks, railcars, or containers. The lamella separates solids and liquids by the use of inclined, closely spaced plates, which allow solids to concentrate on the bottom, and clarified supernatant on the top. The concentrated solids would be pumped to the filter press for dewatering. The supernatant would be pumped to the sand filter for fine particle removal or directly to either effluent storage tank.

Wastes can be pumped to the filter press from the reactor or the Lamella clarifier. The filter press consists of recessed plates covered with filter cloths. When sludge is pumped through the press, solids collect between the cloths and filtrate exits the press. After completion of the cycle, the plates are separated allowing the filtercake to be removed from the press. The filtercake will be disposed offsite at an appropriate disposal facility. Filtrate can be pumped to the reactor, for treatment, to the sand filter for a fine particulate removal, or to either effluent storage tank.

The sand filter is used for fine particulate removal. Waste will be pumped directly from trucks, railcars, or containers, or from the lamella clarifier, the plate and frame filter press, or reactor. After removal of fine solids, the material will go to the carbon column for adsorption or either of the effluent storage tanks.

Wastes can be pumped to the carbon column from the Lamella clarifier or after fine particulate removal from the sand filter. The carbon column removes organic compounds by adsorption. Wastewater's may contain contaminates which could reduce the efficiency of the adsorption system. Suspended solids removal prior to adsorption is necessary to prevent premature excessive pressure drop through the carbon bed. The sand filter will remove these suspended solids. Insoluble oil and grease removal prior to adsorption is necessary to prevent loss of adsorption capacity. The skimmers in the clarifier can remove insoluble oil and grease. High concentrations of Calcium Carbonate or Calcium Sulfate will cause loss of adsorptive capacity. pH adjustment prior to adsorption will increase the wastewater stability saving the adsorptive capacity. After adsorption, the water will be pumped to either of the effluent storage tanks.

The effluent storage tanks can receive decant from the reactor, supernatant from the lamella clarifier, filtrate from the plate and frame filter press, filtrate from the sand filter, and treated water from the carbon column. The effluent will be tested for discharge parameters and pumped to the local sanitary district. If the effluent does not meet discharge parameters it will be pumped back to the reactor for further treatment.

During cyanide or sulfide oxidation, the packed tower scrubber will utilize an alkaline scrubbing medium. The reactor will be operated at a slight negative pressure so emissions will be vented through the scrubber. After oxidation, additional treatments may be necessary depending on the waste constituents. After batch treatment, the material will be pumped to one of the following operations:

- The Lamella clarifier when the waste needs clarification of the liquid phase and concentration of the sludge phase.
- The plate and frame filter press when the waste is concentrated enough for dewatering.
- The sand filter when the waste requires fine particulate removal.

Wastes can be pumped to the Lamella clarifier from the reactor or direct unloading from trucks, railcars, or containers. The lamella separates solids and liquids by the use of inclined, closely spaced plates, which allow solids to concentrate on the bottom, and clarified supernatant on the top. The concentrated solids would be pumped to the filter press for dewatering. The supernatant would be pumped to the sand filter for fine particle removal or directly to either effluent storage tank.

Wastes can be pumped to the filter press from the reactor or the Lamella clarifier. The filter press consists of recessed plates covered with filter cloths. When sludge is pumped through the press, solids collect between the cloths and filtrate exits the press. After completion of the cycle, the plates are separated allowing the filtercake to be removed from the press. The filtercake will be disposed offsite at an appropriate disposal facility. Filtrate can be pumped to the reactor, for treatment, to the sand filter for a fine particulate removal, or to either effluent storage tank.

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The effluent storage tanks can receive decant from the reactor, supernatant from the lamella clarifier, filtrate from the plate and frame filter press, filtrate from the sand filter, and treated water from the carbon column. The effluent will be tested for discharge parameters and pumped to the local sanitary district. If the effluent does not meet discharge parameters it will be pumped back to the reactor for further treatment.

The flexibility of this system allows treatment of many listed hazardous wastes including electroplating Wastewater's, other listed inorganic Wastewater's, landfill leachate, solvent contaminated wastewater's, and other organic contaminated wastewater's.

2.5 Lab pack Operations

Lab Packs will be placed into storage areas upon receipt at the plant. Prescreened unknown lab packs will not be repackaged or consolidated on-site. Inorganic Lab packs for Treatment in the plant will be unpacked and transported to the pour off area located on reactor #1. The storage areas and the inorganic pour off area all have separate containment. Individual containers will be emptied into the lab sinks located in the hood in the inorganic lab pack pour area. Materials poured off and rinsewater from cleaning the containers flows into Reactor #1. Reactor #1 is partially filled with water prior to pour off for increased heat capacity during pour off. After pour off, Reactor #1 will be sampled and analyzed to determine appropriate treatment. This material could be treated with the following: neutralization, oxidation, reduction, air stripping, chelation breaking, chemical precipitation, coagulation, flocculation and dewatering. Refer to the lab pack procedures included in Attachment 1.

Lab packs for repackaging or consolidation will be transferred to a consolidation area or to the repack/consolidation area shown on CHCI DWG. No. 4211. This area for recapping contains six separate bays each with segregated containment capacity. The bays will be segregated for the following wastes: Pesticides, Oxidizers, Bases, Acids, Organics and Flammables. Each bay has capacity for five drums except the flammable by which has a capacity for six drums. Containers from lab packs will be removed and repacked for shipment to appropriate disposal facilities. The area for consolidation includes an organic pour off station with four drum locations. Each location drum has a lid/funnel arrangement to allow pour off with individual exhaust blowers to pull off vapors during pour off. The air from the exhaust blowers goes through carbon canisters before exhaust. The four areas allow segregation for different types of organic wastes. Building 26 has an organic pumping area and Building 25 has a flammable pour-off area, which exhaust through carbon canisters where organic lab packs may also be poured off. Building 25 also has pour-off hoods for acidic, alkaline and solid lab packs. The acidic and alkaline pour off vent to alkaline and acidic scrubbers respectively. The solids pour-off hoods vent to a dust collector. Consolidation areas equipped with fume hoods for lab pack consolidation are also located building 26, three areas in Building 25, the Staging Bay of Process Building #2, and inbound Staging Area adjacent to Unit Q. These empty containers will be reclaimed, or crushed for landfill disposal. Listed wastes for treatment on-site will be pumped to the listed waste treatment systems. These wastes will be segregated from other wastes treated at the facility.

2.6 Fuel Blending Operation

The fuels blending facility receives waste in bulk and container quantities. The bulk shipment may be by rail, over-the-road transporter or vacuum truck. The containers can range in size up to 500 gallons tote. Although for the most part, the containers (drums) will be of 30 to 55 gallons in size. The shipments of the blended fuels will be sent via railcar or tanker trucks. All incoming and outgoing shipments will be carried out by licensed transporters in bulk highway or rail units.

The system is designed to handle 24,000 GPD (450 drums/day) of waste in drum quantities and 36,000 GPD of waste in bulk quantities. The process flow, piping and instrument diagram is depicted on Dwg. No. 4207 while the equipment layout and storage tank details are shown on Dwg. Nos. 4209, 4213 & 4215.

The types of wastes to be processed by the facility through this operation are are generically grouped into five categories:

- Non Halogenated Organics
- High BTU Lean Water
- Non Halogenated Oil
- Organic Liquids with Halogen
- Halogenated Multilayered Organic

Prior to scheduling a shipment into the Fuels Blending Operation, general pre-acceptance procedures will be followed as outlined in the facility's Waste Analysis Plan (WAP). In addition, the waste samples will be subjected to specific criteria and tests. The waste material will have to meet the acceptance levels and in-lab tests for blending and homogenizing to produce a mixture that would meet the acceptance criteria of final disposal facility. The tests will comprise of mixing evaluation for possible ultimate size of solid particles, the ease of waste removal & mixing, and observations for possible polymerization or adverse reactions. The wastes that are not compatible for mixing with other wastes but meet other acceptance criteria, will only be accepted if they can be practically segregated for independent mixture formulation or be shipped to an approved offsite disposal facility, without any further treatment.

Each incoming shipment of the waste will be screened for the specifics such as reasonable resemblance of the shipment characteristics with that of the preapproved representative sample. The other general checks that shipment of any waste at the facility has to go through – such as manifest audit, shipment inspection etc., will also be followed as outlined in the Waste Analysis Plan. All incoming shipments will be sampled upon receipt as per the WAP. Prior to the release, the outgoing shipments will be analyzed to meet all requirements of the facility receiving the shipment.

After inspection, sampling, and compatibility testing, incoming bulk loads will be pumped through a 3/8" strainer to the Fuels Tank Farm for their storage into one of the nine 12,800-Gallon tanks, or one 19,800-Gallon tank. Wastes that do not need any blending or mixing will be directly pumped into one of the storage tanks. The truck or railcar unloading/loading procedures for flammable and ignitable wastes follow standard Clean Harbors procedures included in Appendix D-2.

After inspection and sampling, incoming containers of wastes for fuels blending will be stored in the appropriate container storage areas. Drums will be scheduled and recovered from the storage areas and brought to the staging area of the fuels blending building for the waste processing. The schedule will be determined by the waste content of the drums and the available mixing media to maintain the blended fuel within its chemical and physical parameters for their eventual beneficial use.

Drums are re-sampled at the staging area of the fuels blending operation to confirm the content and, only then, emptied through the automated de-drumming system. This system is designed to minimize exposure of workers and the potential for fires & explosions by controlling emissions through a vapor recovery system, by frequent monitoring of the operating area for organic vapors and by providing proper safety equipment to all employees. In basic terms, the systems include a queue of inspected and approved drums (55 gallons and smaller) on a conveyer, fed into the de-drumming booth, one at a time. After the drum enters the booth, the booth is closed, air inside the booth is displaced with a nitrogen purge to a safe level, the hopper is opened by retracting the cover, the flat bottom of the drum is tilted to an angle. An auger enters the drum and is pulled out removing the material from the drum and dumps the waste into the dispersion chamber. . This is repeated three times. After the drum is emptied it is visually inspected to insure that it is RCRA empty. The drum is then crushed within the hopper. After the crushing operation is completed, the hopper opening is closed and the space inside the booth is purged with nitrogen for a predetermined amount of time. When purging is complete, booth is opened and crushed drum is discharged to a container for transportation to a secure landfill, incinerator or recovery.

The dispersion tank is connected with a recycle line from the fuel blending tanks to enable bringing the liquid waste to the tank. The liquid waste is mixed with the waste forced out of the drum, making the content of the tank pumpable. Thus, the blended fuels will be recirculated through the dispersion tank and mix tank, as needed, to control the viscosity of the wastes being removed from the drums. Emissions from the hopper, dispersion tank and mix tank are vented to a duel bed carbon adsorption system.

From the dispersion tank, the waste is pumped through a 3/8"strainer to the blending tank. When a maximum of 1,225 gallons has been placed in the blending tank, the contents of the blending tank are pumped to one of the nine 12,800 gallon or one 19,800 gallon bulk storage tanks.

The blending tank will be a cone bottom, steel, 1,225-gallon in capacity and fitted with an agitator. The nine 12,800 gallon and one 19,800 gallon bulk storage tanks will also be cone-bottomed. Each tank will be fitted with an agitator to keep the content mixed and homogenized. All tanks will have ultrasonic level indicators with a high-level alarm set to maintain desired freeboard in the tank. Each tank will be nitrogen blanketed for safety and will be connected to conservation vents. The working losses from the conservation vent will be treated for removal of volatile organics through a dual bed carbon adsorption unit.

The bulked/blended fuels will be pumped from storage tanks either to the shredding system storage tank farm or into railcar or truck, for its shipment to an offsite facility for either a beneficial use or a disposal.

2.61 Hazardous Waste Shredding Operation

CHSI is approved to construct a Hazardous Waste Shredding Operation. The waste shredding facility will receive waste in bulk and container quantities. The bulk shipment may be by rail, over-the road transporter or vacuum truck. The containers can range in sizes up to 500-gallon tote. Although for the most part, containers (drums) will be of 30 to 55 gallons in size. The shipments of dispersible materials

The system is designed to handle 48,000 pounds per hour and an average capacity of 30,000 pounds per hour. The piping and instrument diagram is depicted on CHSI Drawing No. 4286 while the equipment layout and storage tank details are shown on CHSI Drawing Nos. 4287, 4291, 4294 and 4295.

The types of waste to be processed by the facility through this operation are generally grouped into five categories:

- Non halogenated organics
- High BTU lean water
- Non halogenated oil
- Organic liquids with halogens
- Halogenated multilayered organics

Prior to scheduling a shipment into the Waste Shredding Operation, general pre-acceptance procedures will be followed as outlined in the facility's Waste Analysis Plan (WAP). In addition, the waste samples will be subjected to specific criteria and tests. It will have to meet the acceptance levels and in-lab test for blending and homogenizing or be non-dispersible and produce a mixture that would meet the acceptance criteria of the final disposal facility. The test will comprise of mixing evaluation for possible ultimate size of sold particles, the ease of waste removal & mixing, and observations for possible polymerization or adverse reaction. The wastes that are not compatible for mixing with other wastes but meet other acceptance criteria, will only be accepted if they can be practically segregated for independent mixture formulation or be shipped to an approved offsite disposal facility, without further treatment.

Each incoming shipment of the waste will be screened for the specifics such as reasonable resemblance of the shipment characteristic with that of the preapproved representative sample. The other general checks that any shipment of waste at the facility has to go through – such as manifest audit, shipment inspection, etc., will also be followed as outlined in the Waste Analysis Plan. All incoming shipments will be sampled upon receipt as outlined in the Waste Analysis Plan. Prior to release, the outgoing shipments will be analyzed to meet all requirements of the facility receiving the shipment.

After inspection, sampling, and compatibility testing, incoming bulk loads will be pumped to the Fuels Tank Farm (Unit 16) (nine 12,800 gallon tanks, one 19,800 gallon tank) or the Flammable Liquid Tank Farm (Unit 22) (two 10,558 gallon tank, one 15,547 gallon tank, one 6,136 gallon tank) for storage. Tanks 103,104, 105, 106 and 109 in Unit 16 and Tanks 415 and 416 in Unit 22 will be used for blended liquid storage for the shredder operation. Tanks 102 and 110 in Unit 16 and Tank 417 in Unit 22 will be used for diligent storage and feed to the shredding operation. Wastes that do not need any blending or mixing will be directly pumped into one of the storage tanks. The truck or railcar unloading/loading procedures for flammable and ignitable wastes follow standard Clean Harbors procedures included in Appendix D-2.

After inspection and sampling, incoming containers of wastes for shredding will be stored in the appropriate container storage areas and transferred using forklifts from unit 61 across a metal ramp in Unit 62 and through a contained area to Building 42. CHSI will utilize the permitted drum storage of 28 drums in Building 42 and 24 drums on the west side pad. Drums will be scheduled by the waste content of the drums and available mixing media to maintain the chemical and physical parameters for dispersible or non-dispersible materials.

The shredder operates on a batch basis, typically two 55-gallon containers at a time. The containers are placed into the hopper inlet, which is then purged whit nitrogen along with the primary shredder shear chamber. The containers are dropped into the primary shredder which uses low speed shear action to puncture the waste containers, free the contained liquid, semi-solid and solid waste materials, and reduce the container carcass to small pieces. Low viscosity liquids from the Fuels Tank Farm (Unit 16) or the Flammable Tank Farm (Unit 22) are also added to assist the flow of the shredded materials. These materials are further sized through the secondary low-speed, shear-type shredder. Shredded metal from containers are captured using a rotary magnet. In dispersible materials operation, this metal drops onto a vibratory shaker screen to further remove contaminants from the shredded metal fragments. One drum collects shredded metal (for metalwashing) and another drum collects the contaminants (rerouted to the shredder).

In the dispersible materials operation, decontainerized wastes are conveyed through a feed chamber for the dual screw auger to the Hydropulpar Tank (Tk-414). At times low viscosity liquids from the Fuels Tank Farm (Unit 16) or the Bulk Flammable Tank Farm (Unit 22) are added to the Hydropulpar Tank to adjust the end product. The Hydropulpar Tank blends with a rotating blade at the bottom of the tank to mix materials into a thick flowable liquid. This blended material is transferred through an in-line grinder to the Fuels Tank Farm or the Bulk Flammable Liquid Tank Farm. The bulked/blended fuels will be pumped from storage tanks either into a railcar or truck, for its shipment to an off-site facility for either a beneficial use or disposal.

The Hydropulpar Tank (Tk-414) will be constructed of carbon steel and have an operating capacity of 2500 gallons and a total capacity of 3490 gallons. This tank is nitrogen blanketed and vents to a carbon adsorption system (same as the Bulk Flammable Liquid Tank Farm). The tank is vented through a flame arrestor and has an emergency vent. The tank is also equipped with a liquid level point monitor, which is electronically connected to a high-level alarm system.

In non-dispersible materials operation, shredded materials are conveyed through the dual screw auger to the opposite side of the Hydropulpar Tank by reversing the auger direction. This material is loaded into a covered hopper which when full is emptied into a roll-off or off-site shipment.

2.62 Metalwashing Operation

CHSI is approved to construct a Metalwashing operation. The metalwashing operation will be utilized to clean shredded metal fragments from the shredding operation or off-site generated metal, which can be reclaimed after cleaning. All containers of metal will be visually inspected prior to processing to assure the metal can be processed.

Metal fragments are dumped into a feed hopper attached to a screw auger to convey the metal fragments to the Metalwash Tank (Tk-424). This tank will be filled with solvents, typically chlorinated, which will be pumped from storage in Tanks 101 and 107 in unit 16 or Tank 418 in Unit 22. The Metalwash Tank includes an auger that moves metal through the tank. A screw auger is used to convey metal fragments to the Rinse Tank (Tk-427). Another screw auger removers sludge from the Metalwash Tank to a drum. After the metal fragments are rinsed, they are conveyed by a screw auger to a clean metal hopper. Cleaned metal will be transferred to a roll-off located on unit 60. The cleaned metal will be sent off-site for reclamation.

The Metalwash Tank has a capacity of 3,730 gallons and the Rinse Tank has a capacity of 987 gallons. Both tanks are constructed of carbon steel and are equipped with level alarms. The metalwash Tank has an emergency vent and will be nitrogen blanketed to eliminate the potential for fires or explosion. The feed hopper will vent to the carbon adsorption system (same as the Bulk Flammable Tank Farm) to control organic air emissions.

2.6 Rail Car Transfer Operations

CHSI operates a concrete-lined storage area for railcar transfer operations (Unit 13). The railcar area is located next to the Ignitable Liquids Tank Farm and is sized to accommodate up to two (2) 30,000 – gallons rail tank cars.

Waste materials may be transferred between the railcars and the tank farm, between truck and railcar. All material transfer operations are conducted using the Clean Harbors rail/truck standard operating procedures listed in Appendix-D-2 in Attachment 1.

2.7 Hazardous Waste Transfer Facility/Truck to Truck Transfer

Under the hazardous waste transfer facility requirements of 35 IAC 723.112, a hazardous waste transporter who stores manifested shipments of hazardous waste in containers meeting the requirements of 35 IAC 722.130 for a period of ten days or less is not subject to regulations under 35 IAC 702, 703, 724, 725 or 728 with respect to the storage of those wastes.

CHSI currently operates a transfer facility for hazardous waste in containers and tank trucks, which are in-transit to facilities other than CHSI. Such vehicles are allowed to stop at the facility for a period of up to 10 days.

In addition, CHSI performs truck-to-truck transfers of waste between in-transit vehicles. Truck to truck transfer activities are accomplished by parking two (2) in-transit trailers either at a loading dock or tailgate-to-tailgate and then directly transferring the container (s) from one vehicle to the other, or transferring bulk liquids or solids from one transport vehicle to another for continuing transport offsite. The containers being transferred are not opened or staged on the loading dock or on the ground during the transfer. Once the transfer is complete, the accompanying manifest (s) are modified to reflect the continuing transport of the transferred containers, and the vehicles continue their shipments to there next intended destination.

CHSI documents all in-transit/truck to truck activities. A copy of the log and drum grid sheet used to track these activities are included in Appendix D-2.

Acid/Base Labpack Pour-Off Standard Operating Procedure

Equipment:

Full-Face cartridge respirator
Full-air respirator
Chemical dictionary
Tyvek suit
Gloves - inner latex, outer PVC
Disposable pipettes
pH paper
Oxidizer paper
5 plastic gallon pails
Gondola (container used to transport unpacked chemicals from drum staging area to pour-off chamber staging area - **see illustration below**)
2 bags of speedy-dry
Shovel
Portable dumpster

Drum Type Selection

Operations will decide daily what type of material will be poured-off (i.e. acids, bases, organics). Only drums of that type can be processed during the day.

Drum Staging

Drums will be staged only in areas compatible with the drum type - acids in acid bay, bases in bases bay, non-haz in either bay. Drums may also be unpacked in the inside staging area, provided there are no drums of incompatible material in that area.

Set-up Procedures

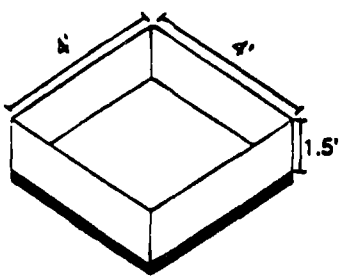
Required Equipment:

pH paper
Oxidizer paper
Disposal droppers
Two 16 gallon kiln packs
Chemical dictionary
Two bags of speedy-dry

1) After appropriate area has been selected for staging, an area is to be set-up for spot and compatibility testing of unpacked chemicals. Appropriate tests will typically include pH, oxidizer properties, and chamber compatibility*. This area will also accommodate a chemical dictionary.

2) A minimum of two empty 16 gallon kiln packs are to be put in the staging area to hold materials for repack that are deemed incompatible with the Chicago treatment system.

3) Two bags of speedy-dry are to be placed in the staging area in the event of a spill or leak.



Gondola

* A chamber compatibility test is an attempt to predict how a given material will react when emptied into the pour-off chamber. The test is done by placing a small amount of sample (1-2 mls) into approximately 500 mls of the pour-off chamber, watching for any obvious physical reactions. If none are evident, an additional 1 ml sample is added. If no reactions are observed, the material is approved for pour-off. Experience has shown this test to be very reliable.

Preparatory Lab Analysis

1) A one to two gallon Coliwasa sample will be taken from the pour-off chamber to be analyzed by the lab. Lab testing will include pH, neutralization, NH_3, CN, and Cr^{+6} spot testing and Ni analysis by atomic absorption.

2) Optimum pH of the pour-off chamber is 7.0. The lab will decide what chemicals (sulfuric acid or sodium hydroxide) will be added to approach the optimum pH. **Unacceptable pH values are <4 and >10. At no point should the pH of the chamber fall below or above these ranges, respectively.**

5) If the chamber is empty, the lab will decide from which treatment tank to pump approximately 1000 gallons into the pour-off chamber. **At no time should labpacked chemicals be poured into the chamber with less than 1000 gallons present.**

6) After the addition of the appropriate chemicals, the chamber will be resampled and re-analyzed. Once the optimum pH is reached, a two gallon sample will taken by the pour-off chemist for compatibility testing of unpacked chemicals. The chamber volume will be estimated at this time. The pour-off chamber maximum capacity is 3500 gallons.

Drum Unpacking Procedures

Required Equipment:
- Full-face cartridge respirator
- Tyvek suit or protective apron
- Gloves - inner latex, outer PVC
- Coliwasa sampler
- Shovel
- Portable dumpster

1) Chemist will review packing slip of prospective drum, noting materials incompatible with the Chicago treatment system.

Common materials unsuitable for Chicago aqueous treatment
- listed wastes
- water reactives
- air reactives
- flammables
- insoluble materials
- elemental mercury and mercury containing compounds (no D009 wastes)
- concentrated chelating agents (i.e. unused EDTA)
- Solids are discretionary based on known solubility properties

Because of compliance, treatability, and safety issues, all labpack shipments into Chicago must be pre-approved (by packing slip) through Chicago technical services prior to scheduling. This policy will be strictly enforced.

2) As the chemist pulls each container from the drum, the container is visually inspected for a contents identification label. Any container not identified will be tested for compatibility. Any container with a volume of two gallons or greater will also be tested for compatibility, regardless of whether the container is properly identified. Chemicals unfamiliar to the chemist will be identified using the chemical dictionary in addition to a required compatibility test.

3) Materials which have been deemed suitable for pour-off are placed into the gondola after container caps are checked for tightness. Any leaking container will be placed inside a 5 gallon pail prior to being put into the gondola. Materials which are deemed unsuitable for pour-off are segregated and placed into the 16 gallon kiln packs for later repack. Extreme care should be excercised not to overfill gondola as it would compromise safety and increase likelihood of accident during transport to pour-off chamber staging area.

4) When a gondola is full, the gondola will be moved to the pour-off chamber staging area by fork lift.

5) A sample of the chamber is taken after each gondola is processed for lab analysis. Additional chemicals will be added if necessary to maintain proper pH. After the addition of appropriate chemicals, a two gallon sample of the chamber is taken for compatibility testing.

6) Packing vermiculite will be shoveled into the portable dumpster for disposal. Empty drums will be set aside for reclaim or crushing.

Pour-Off Procedures

Required Equipment:

Full air respirator
Air lines, regulator and tank
Tyvek
Gloves - inner latex, outer PVC
Scraper (remove solids from containers)

1) All opening and pouring of unpacked materials is to be done on full air.

2) Containers are moved from the gondola to the counter by the pour-off sink. The lids are removed (rinsed and put in 55 gallon drum for disposal) and the contents are dumped down the sink into the chamber. All material is removed from the container and the empty container is then triple rinsed.

3) Plastic, metal, and fiber containers are put into 55 gallon drums for disposal. Glass containers are thrown down a chute by the pour-off sink. The broken glass shards are collected in a 55 gallon drum for disposal.

4) The chamber volume should be periodically inspected to determine remaining available space. The contents of approximately four 55 gallon drums are in each gondola. This will produce an average pour-off volume of 140 gallons.

5) When chamber is at capacity, the lab will receive a final Coliwasa sample to determine the proper course of treatment for the waste.

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1.0 CONTAINER STORAGE INVENTORY AND WAST E TYPE

Clean Harbors Services, Inc. (CHSI) accepts containers of hazardous wastes with free liquids for storage, consolidation (i.e., bulking or repackage), onsite treatment, and/or transfer to an approved offsite waste management facility. This management guideline shall apply to all containers (e.g., 55-gallon drums, carboys, etc.) which are less than 110 gallons in size.

A list of the container storage areas, the waste streams stored within each area, the maximum number of containers in each area, and typical EPA waste codes is summarized in Table D-1.

2.0 CONDITION OF CONTAINERS

All containers of hazardous wastes that are received at and/or shipped from CHSI shall be in good condition which no severe rusting or apparent structural defects. The containers (e.g., drums, carboys, etc.,) may be new, used, or reconditioned, any may vary in sizes up to 110 gallons. All of the containers shall be made of, or lined with, materials, which will not react with, or are otherwise compatible with the hazardous waste being stored. All container meet US Department of Transportation (DOT) packaging requirements as described in 49 CFR 173, and the labeling and marking requirements of 35 IAC 722, Subpart C, and 49 CFR 172.

In the event that hazardous wastes ARE shipped to the facility in a non-DOT container, or if an accepted DOT-approved container shows signs of structural defects or leakage, CHSI will undertake appropriate action to immediately transfer the waste and/or container into an acceptable container or overpack drum.

Table D-1: Container Management Area

Type	Container Management Area	Waste Category (See Note 1)		Number/Volume
I.	DRUM STORAGE AREAS (55-GALLON DRUMS, OR EQUIVALENT			
	A. Existing Areas			
	DRUM STORAGE ARE (UNIT G1)	- Acidic –1		192
		- Acidic –2		96
		- Alkaline		192
		- Staging		72
			Subtotal	552
	DRUM STORAGE AREA (UNIT R1)	- Oxidizer		96
		- Reactive		96
		- Poisons		96
		- Flammable – 1		160
		- Flammable – 2		160
		- Staging (Inbound)		160
			Subtotal	768
	DRUM Storage Expansion (UNIT R2)	- Oxidizer		96
		- Reactive		96
		- Poisons/PCB's		96
		- Staging (Outbound)		80
			Subtotal	368
	Lab Pack POUROFF STATION (UNIT F1)	- Alkaline/Acids		8
				8
	CONTAINER MANAGEMENT Building (UNIT 25)	- Alkaline/Poison		248
		- Acids		136
		- Flammable		184
		- Truck Pad		88
			Subtotal	656
	IGNITABLE CONTAINER MANAGEMENT Building (Unit 26)	- Ignitable/PCB		192
			Subtotal	192
	Container HANDLING Dock (Unit 61)	- Staging		160
			Subtotal	160
	B. Approved/Not Yet Constructed Area			
	DRUM Storage Expansion (UNIT R2)	- Flammable – 3		160
			Subtotal	160
	Lab pack REPACK & CONSOLIDATION AREA (UNIT U)	- Acid/Alkaline		10
		- Other		25
			Subtotal	35

Table D-1: Continued

Paint and Paint Related Processing Area (Unit 42)	- Westside Pad		24
	- Building		28
	- Hopper (405)		64 Cu.Ft
		Subtotal	52 Plus 64 Cu.Ft.
Shredder Process Building (Unit 24)	- Conveyor		16
	- Drum (412)		1
	- Tote (407)		64 Cu.Ft.
		Subtotal	17 Plus 64 Cu.Ft.
Metal Wash Pad (Unit 68)	- Drum (434)		1
		Subtotal	1

C. Facility Total

---- 2,969 55-gallon drums (163,295 gallons total), or equivalent plus 128 Cu.Ft.

(continued)

Table D-1: Continued

Type	Container Management Area	Waste Category (See Note 1)	Number/Volume
II.	BULK SOLIDS STORAGE AREAS		
	A. Existing Storage Areas		
	BULK CONTAINER STORAGE AREA (UNIT Q1)	All characteristic and listed wastes (except water-reactive solids)	Three (3) rolloffs AT 30 CY PER UNIT (OR EQUIVALENT)
	Bulk Solids Storage pad (Unit B)	All characteristic and listed wastes (except water-reactive solids)	Eight (8) rolloffs AT 30 CY PER UNIT (OR EQUIVALENT)
	B. Approved/Not Yet Constructed Areas		
	LISTED WASTE ROLLOFF STORAGE (UNIT Z1)	Listed waste treatment residuals (F – and K- codes) solids)	One (1) rolloff AT 30 CY PER UNIT (OR EQUIVALENT)
	D. Facility Total		
	--- Twelve (12) 30-cubic yard rolloffs (300 cubic yards total), or equivalent		

(continued)

Table D-1: Continued

Type	Container Management Area	Waste Category (See Note 2)	Number/Volume
III. TRANSPORTATION UNIT CONTAINER STAGING/STORAGE AREAS (SEE NOTES 2 & 3)			
A. Existing Areas			
TRUCK Unloading AREA & BULKING AREA (UNIT Q)		All hazardous and non-hazardous wastes	Three (3) units
TRUCK Loading DOCK (Unit V)		All hazardous and non-hazardous wastes, expect bulk ignitable liquids	Three (3) units
BULK SOLIDS STORAGE PAD (UNIT B)	(SEE NOTE 4)	All hazardous and non-Hazardous Wastes, except hazardous wastes in bulk liquid transport vehicles	Eight (8) units
Railcar Unloading Area (Unit 13)		hazardous waste fuels (organic/ignitable), including bulk ignitable liquids	Two (2) railcars @ 30,000-gal each
Truck Staging Area (Unit 59)		All hazardous and non-hazardous wastes, including bulk ignitable liquids	Three (3) units
Truck Staging Area (Unit C)		All hazardous and non-hazardous wastes, except bulk ignitable liquids	Six (6) units
TRUCK Unloading Platform (Unit 15)		hazardous waste fuel (organic/ignitable), Including bulk ignitable Liquids	Two (2) units
Container Handling Dock (unit 61)		All hazardous and non-hazardous waste, except Bulk ignitable liquids	Four (4) units
Approved/Not yet Constructed Areas			
Truck to Truck Transfer Dock (Unit W)		All hazardous and non-hazardous wastes, except Bulk ignitable liquids	Four (4) units
TRUCK Loading/ Unloading pad (unit X)		All hazardous and non-hazardous wastes, except Bulk ignitable liquids	Two (2) units
TRUCK Loading/ Unloading pad (unit 69)		All hazardous and non-hazardous wastes, including Bulk ignitable liquids	Two (2) units

(continued)

Table D-1: Continued

Type	Container Management Area	Waste Category (See Note 2)	Number/Volume

(SEE NOTES 2 & 4)

D. Facility Total

--- Rail: Two (2) railcars (60,000 gallons total), or equivalent
--- Highway: Twenty-seven (29) units (208,800 gallons total), or equivalent

Notes:

1. Typical waste codes/categories accepted and stored included, but are not limited to, the following:

   Acids - D002, D004-D011, F006, F019, K002-K008, K031, K048-K052, K061, K062, K069, K084, K086, K100-K120, K1-6, P011, P012, U144-U146, U246

   Alkalines - D002, D004-D011, F006, F019, K002-K008, K031, K048-K052, K061, K062, K069, K084, K086, K100-K120, K106, P012, U144-U146, U246

   Ignitable/Organic – Wastes which exhibit a flash point of less than 140F, halogenated and non-halogenated solvents, pur organics, and aqueous wastes containing organic materials. Includes waste codes D001, D012-D043, F001-F005, F020-F024, F026-F028, K001, K009-K030, K032-K043, K060, K073, K083, K085, K086, K051, K052, K093-K099, K103-K105, P004, P005 P022, P037, P048, P050, P051, P059, and most U-codes.

   Oxidizer - D001

   Poison/PCB - Waste poisons, acute toxics (F020-F023, F026, F027 and P-codes), and PCB's.

   Reactive - D003, F006, F007-F011, F012, F019, P013, P021, P029, P030, P063, P074, P098, P099, P104, P106, P006, P009, P042, P065, P112, P081, P122, U006, U223, U020, U023, U160, U033, U096, U133, U189, U205, U223, U23

2. Highway units can include box trucks, van trailers, flat beds, vacuum truck, and bulk transporters. However, for the purpose of calculating the facility's licensed hazardous waste storage capacity and secondary containment requirements, CHSI has adopted a worst-case approach and assumed that each "unit" is a 7,200-gallon bulk liquid transport vehicle.

3. CHSI notes that the 10-day in-transit storage and truck to truck transfer activities may be conducted in any of the RCRA-REGULATED designated staging/storage areas AND IN OTHER TRANSPORTATION-RELATED AREA THROUGHOUT THE FACILITY WITHOUT REGARD TO LOCATION OR NUMBER in accordance with hazardous waste transfer facility regulations at 35 IAC 724.101(f)(9).

4. DUE TO SECONDARY CONTAINMENT LIMITATIONS, THE BULK SOLIDS STORAGE PAD (UNIT B) IS NOT AUTHORIZED FOR STORAGE OF BULK HAZARDOUS WASTE LIQUID TRANSPORT VEHICLES. BOX OR VAN TRAILERS CARRYING DRUMMED LIQUIDS MAY BE STORED UP TO A LIMIT OF 80 55-GALLON DRUMS (OR EQUIVALENT) PER VEHICLE. DRUMMED OR BULK SOLID CONTAINERS MAY BE STORED UP TO A LIMIT OF 30 CUBIC YARDS PER VEHICLE. HAZARDOUS WASTE TRANSPORTERS STORED IN THE BULK SOLIDS STORAGE PAD SHALL BE COUNTED TOWARDS THE UNIT'S AUTHORIZED ROLLOFF STORAGE CAPACITY. AS A RESULT, THE SIX VEHICLES ARE NOT INCLUDED IN THE FACILITY'S PERMITTED TRANSPORTATION STORAGE LIMIT.

3.0 HANDLING

3.1 Manual Roll

Manual movement or "rolling" of containers may be required during routine drum sorting, warehousing, or vehicle loading/ unloading activities. The procedure to be followed for manually "rolling" containers are:

1. Wear proper safety equipment including safety shoes, long sleeve shirt, hard hat, safety glasses and gloves.
   CONSULT THE FACILITY'S PROTECTIVE EQUIPMENT GUIDE (TABLE F-4) FOR ADDITONAL REQUIREMENTS SPECIFIC TO THE ACTIVITY.

2. Make sure all bungs are in place and tightened.

3. Breaking Drum (reverse if Lefty)
   a. Place right hand on top chime @ 12 o'clock
   b. Place left hand on adjacent drum or wall
   c. Have firm stance
   d. Pull weight of drum to right thigh until drum on bottom chime OR push with 2 hands on drum to tilt on bottom chime and walk around. In no case is a container to be tipped over and rolled on its side.

4. To move, roll drum on bottom chime, slide hands along top. Do not remove hands from drum; push in direction desired.

5. To set down
   a. Stop drum motion
   b. Watch feet and hands from getting caught beneath drum or between drums.

Personnel are advised to take the following precautions during manual drum movements:

1. Make sure drum IS under control at all times.

2. Before breaking, make sure drum weight does not exceed that controlled by one (1) person – 800 lb.

3. If losing control, warn others in area; let go of drum and stay clear.

4. Make sure hands and feet are free when setting drum down.

5. Do not muscle drum.

3.2 Two –Wheeled Carts

Two-wheeled carts may be used to move heavy drums or to move drums up an incline. In operating a tow-wheeled cart, the following procedures are to followed:

1. Wear proper safety equipment, including hard hat, safety shoes safety glasses, gloves, AND long sleeve shirt.
   CONSULT THE FACILITY'S PROTECTIVE EQUIPMENT GUIDE (TABLE F-4) FOR ADDITIONALREQUIREMENTS SPECIFIC TO THE ACTIVITY.

2. Make sure all bungs are in place and tightened.

3. Place two-wheeled cart next to drum so tires are on bottom of drum chimes.

4. Place hook on two-wheeled cart on top of drum. Make sure it is secure.

5. Place foot on two-wheeled cart.

Personnel are advised to take the following precautions while using a two-wheeled cart:

1. Never leave drum on two-wheeled cart when not moving.
2. Never leave two-wheeled cart on ground. Replace in storage area.
3. Place two-wheeled cart next to drum so tires are on bottom of drum chimes.
4. Place hook on two-wheeled cart on top of drum. Make sure it is secure.
5. Place foot on two-wheeled cart.
6. Pull handles toward you slowly until drum weight balanced over wheels.
7. Place drum down slowly.

3.3 Palletizing Drums

All containers must be placed onto pallets prior to being placed into the storage bays or loaded onto a transport vehicle. The procedures for "palletizing" containers are:

1. Wear proper safety equipment including, hard hat, gloves, safety shores, safety glasses, AND long sleeve shirt.
   CONSULT THE FACILITY'S PROTECTIVE EQUIPMENT GUIDE (TABEL F-4) FRO ADDITIONAL REQUIREMENTS SPECIFIC TO THE ACTIVITY.

2. Make sure pallet has no loose or broken boards.

3. Break drum and roll to pallet so bottom chime is over second board and in middle of pallet.

4. Place drum down.

5. Position body with firm stance.

6. Push up on drum near body until weight on chime.

7. Spin on to pallet and in position.

8. Continue operation with other drums. Roll drums to pallet and position so half of drum is over pallet. Follow from step 4.

9. To remove drums from pallet, reverse process.

Personnel are advised to take the following precautions during palletizing operations:

1. Pallet should have no broken or loose boards.

2. All drums on pallet should be of equal size.

3. Watch feet and hands at all times to avoid other drums or dropping down.

4. If you lose control, let go of drum, move clear and warn others in the are.

3.4 Fork Trucks

The following procedures address the key points to be remembered in operating the forklift in these areas, as well as throughout the facility.

The forklift operator should always be aware of the nature and hazardous properties of the materials being handled. By noting both the DOT/EPA label affixed to each container and the CHSI waste code entered by the receiving chemist, the trained operator will immediately KNOW the type of waste he is handling, ITS COMPATIBILITY WITH OTHER WASTES, and the appropriate staging area within the warehouse to offload the material.

When stacking containers, care must be taken as to not impale the drums (s) with the forklift blade (s) or otherwise damage the container.

4.0 LABELING

4.1 Hazardous Waste

All containers in storage must be stacked with the labels facing the aisles. When there are various labels and markings around the container, the label of concern is that which contains the words "Hazardous Waste" followed by the name of the material (i.e., acetone, toluene), and the hazards associated with the waste (i.e., flammable or ignitable, corrosive, toxic, dangerous when wet, etc.).

All containers must be stored such that the labels are facing out to the sides (and not to the front, rear or inward) so that the label is clearly visible for inspections.

4.2 Land Ban

Upon receipt into the facility, all containers shall be marked with the date of acceptance to ensure compliance with the LDR 1-year storage limit.

5.0 STORAGE

5. 1 Segregation of Incompatibles

Incoming containers will be placed in the staging area during sampling/analysis and paperwork review procedures. Upon confirmation, drums of compatible wastes will be placed in the appropriate segregated storage bay. Individual storage bays are separated by concrete OR STEEL CURBING to prevent liquid migration between adjacent cells. In addition, IN AREAS WHERE AISLE SPACE between INCOMPATIBLE WASTES IS SMALL (E.G. PROCESS BUILDING TWO – CONTAINER STORAGE), metal railings or walls will be constructed between the adjacent bays as a physical barrier to prevent drums from falling off a pallet and into an adjacent bay in which incompatible wastes are being stored.

5.2 Closed Except While In Use.

All containers shall remain closed at all times except while waste is being added, removed, or sampled. Closed head drums must have bungs in place and the bungs must be tightly secured. Open-top drums must have covers, gaskets, and rings, and the covers must be tightly secured.

5.3 Stacking Height

All containers are stacked on pallets within the designated storage bays. Containers in the flammable bays and staging areas are stacked one-high; containers in the other areas are stacked two-high with a pallet between each level of containers.

5.4 Aisle Spacing

The container storage areas have been designed to provide adequate aisle space to ensure unobstructed movement within the unit. The following requirements shall apply: containers which contain RCRA ignitable or reactive wastes must be stored at least 50 feet from the property line.

A minimum two (2) feet center aisle space shall be maintained at all times to allow for inspection and unobstructed movement of personnel and equipment in the event of an emergency.

5.5 Inspections

Container storage areas are inspected daily for accumulation of waste, proper drainage, and any construction material deterioration. Each drum is inspected for structural integrity (corrosion, collapsing, crushing), leakage and proper stacking. A complete description of the container inspection program is included in Section F of the FACITITY'S Part B Application.

5.6 Removal of Accumulated Liquids

Any precipitation or spilled/leaked liquids collected within the secondary containment system will be either treated on-site or containerized (in a drum or bulk tank) and shipped off-site to a properly licensed waste management facility. Depending upon the quantity of accumulated liquid, CHSI shall utilize portable pumps and/or vacuum trucks to remove accumulated liquids. ALL LIQUIDS WILL BE TESTED FOR POSSIBLE CONTAMINATION. THOSE MEETING FACILITY TREATMENT CRITERIA WILL BE TREATED ON-SITE. ALL OTHER WILL BE STORED PRIOR TO OFF-SITE DISPOSAL FACILITIES.

6.0 SAMPLING AND ANALYSIS

CHSI shall sample and analyze the content of individual containers in accordance with the facility's Waste Analysis Plan described in Section C of the RCRA Part B Permit Application. "Sampling" refers to removing a small amount of waste from the container, tank, or vehicle for analytical purpose. Sampling is done with appropriate hand tools (e.g. thief, trier, scoop, coliwash) in areas with containment.

6.1 Drum Opening Procedures

Drums may only be opened when sampling the waste, or when adding or removing waste to/from the container. The following procedures are to be followed when opening any drum:

1. Wear proper safety equipment, including safety shoes, Tyvek suit or apron, long sleeve shirt, chemical resistant Gloves, respirator, face shield, safety glasses, and hard hat. CONSULT THE FACILITY'S PROTECTIVE EQUIPMENT GUIDE (TABLE F-4) FOR ADDITONAL REQUIREMENTS SPECIFIC TO THE ACTIVITY.

2. Place bung wrench firmly on large bung.

3. Open – turn counter clockwise.

4. Turn slowly to release any pressure

5. Continue turning until bung off.

6. Place bung on drum.

7. After sampling or emptying, replace bung.

8. If bung cannot be opened, try to open small bung. If it cannot be opened, UTILIZE DRUM DEHEADER.

Personnel are advised to take the following precautions during drum opening operations:

1. Keep face away from bung in case of pressure in drum.
2. Do not use wrench as a hammer.

6.2 Sampling Methods

The following procedures are to be followed when retrieving samples from containers:

1. Were proper safety equipment, including safety shoes, Tyvek suit or apron, long sleeve shirt, chemical resistant Gloves, respirator, face shield, safety glasses, and hard hat. CONSULT THE FACITLITY'S PROTECTIVE EQUIPMENT GUIDE (TABLE F-4) FOR ADDITIONAL REQUIREMENTS SPECIFIC TO THE ACTIVITY.
2. Check label and/or manifest to group drums.
3. After opening drums (see Opening Drums), check appearance of material before consolidation with other drummed material.
4. Use a clean thief and large mouth container to obtain and contain the sample.
5. Write the in-house code AND TRACKING NUMBER on the sample container.
6. Wipe off the outside of the container.
7. Complete receiving report and deliver reports and samples to the laboratory.

Personnel are advised to take the following precautions during container sampling operations:

1. Do not overfill sample containers or get unequal shares from the drums when consolidating.

2. Carefully observe any reactions or offgassing that might result from incompatible materials. If this does occur, sample these drums separately and not reaction on a sheet of paper (to accompany the samples) for the safety of the lab personnel.

3. Do not pack incompatible samples adjacent to one another.

PROCEDURE: Drums containing liquid wastes can be under pressure or vacuum. A bulging drum usually indicates that it is under high pressure and should not be sampled until the pressure can be safely relieved. A heavily corroded or rusted drum can readily rupture and spill its contents when disturbed; it should only be sampled with extreme caution. Opening the bung of a drum can produce a spark that might detonate an explosive gas mixture in the drum. This situation is difficult to predict and must be taken into consideration every time a drum is opened. The need for full protective sampling equipment cannot be overemphasized when sampling a drum.

1. Position the drum so that the bung, or end to be opened, is up (drums with the bung on the end should be positioned upright; drums with bungs on the side should be laid on its side, with the bangs up).

2. Allow the contents of the drum to settle.

3. Slowly loosen the bung with a bung wrench, allowing any gas pressure to release.

4. Remove the bung or drum top and collect a sample through the bunghole or open drum top with an appropriate sampler.

5. When there is more than one drum of waste, segregate and sample the drums according to waste types.
   A. Coliwawsa procedure (liquids or slurries)
      1. Clean Coliwasa.
      2. Adjust sampler's closing mechanism to ensure that the stopper provides a tight closure. Open sampler by pushing the inner rod down until the handle sits against the sampler's top.
      3. Slowly lower the sampler into the waste at a rate that permits the level of liquid inside and outside the sampler to remain the same. If the level of waste in the sampler tube is lower inside than outside, the sampling rate is too fast and will produce a nonrepresentative sample.
      4. When the sampler hits the bottom of the waste container, push sampler tube down to close.
      5. Withdraw Coliwasa from waste and wipe the outside with a disposable cloth or rage.
      6. Discharge sample into an appropriate container.

B. Thief Procedure (Dry powders or Granules)
   1. Clean sampler.
   2. Insert closed thief into waste material. Rotate inner tube to pen thief. Wiggle the unit to encourage material to flow into thief. Close thief and withdraw. Place sampler thief in a horizontal position with the slots facing upward. Remove inner tube from thief and transfer sample to a container.

C. Trier Procedure (Sticky solids and Loosened soil)
   1. Clean trier.
   2. Insert trier into waste material 0 to 45 from horizontal. Rotate trier to cut a core of the waste. Remove trier with concave side up and transfer sample to container.

D. Auger Procedure
   1. Clean sampler.
   2. Bore a hole through the middle of an aluminum pie pan large enough to allow the blade of the auger to passthrough. The pan will be used to catch the maple brought to the surface by the auger.
   3. Place pan against the sampling point. Auger through the hole in the pan until the desired sampling depth is reached. Back off the auger and transfer the sample in the pan and adhering to the auger to a container. Spoon out the rest of the loosened sample with a sample trie

6.3 Waste Screening Methods

This operating procedure will cover ways and means of screening via quick test samples of drummed material received at the CHSI facility. The objective of this procedure is to determine: 1) whether the material received corresponds generally to the manifested material, 2) the correct area in which to place the drums, and 3) whether the drums contain any material which could preclude their acceptance at the facility.

The Screening tests performed on the drum samples would include the five procedures outlined below. All results obtained in these screening tests are to be recorded in the proper place on the Internal Drum Receiving Sheet.

A. pH

1. Liquids – determine pH using full range ph paper or portable pH probe.
2. Solids – Mix 10 parts reagent water to one part solid. Determine ph of liquid using full range ph paper or portable ph probe.

B. Water Solubility Reactivity

1. Liquids – Using disposable plastic medicine dropper, add a small amount of sample to a test tube filled approximately 1/3 full with reagent water. Mix well.
2. Solids – Add a small amount of solid to 10-ml reagent water. Mix well.
   a. Note solubility. If insoluble, note whether sample floats or sinks.
   b. Note any reaction with water, i.e. generation or heat or gas.

C. Ignitability

1. Ignite a small portion of sample in an aluminum dish. It is important to determine whether the sample flashes. Many materials burn without flashing, other substances such as fuels and solvents may flash as they ignite.
2. Determine is the sample fumes ignite, without touching the match directly into the sample. If the fumes ignite, report flash point less than 70°F.
3. If no fume ignition, touch the match directly to the sample. If sample ignites report as great than 70°F but less than 140°F. If sample does not ignite, report as greater than 140°F.

D. Reactive Cyanide

1. This procedure is for the detection of hydrocyanic acid and cyanides. Use for all samples with a ph of 8 or higher.
2. Do not use this test if the sample caused the ph paper to turn yellow. These samples tend to contain strong reducing agents. These reducers will cause a violent heat reaction. Consult your supervisor.
3. Aqueous Liquids – Place 5-10 ml of sample in a test tube. Solids and non aqueous liquids – add 1 gram sample to 10 ml in Sodium Hydroxide solution.
4. Add a small amount of sodium bicarbonate to the test tube. This eliminates interferences by volatile oxidizing or reducing agents, which are liberated.
5. Add 1 drop of concentrated sulfuric acid to the test tube and mix. (Too much acid will destroy the cyanide reagent).

WARNING: CONCENTRATED ACID CAN CAUSE A VIOLENT HEAT REACTION

6. Shake the acid sample immediately.
7. Immediately place a piece of cyanide test paper into the test tube, in the area of the gas zone, above the liquid level.
8. Wait 15 minutes for reaction, since low concentrations of HCN require a longer development time.
9. A positive reaction is a color change to a deep blue, in the treated center strip of the test paper. Sensitivity is 0.2 mg/1 HCN after a 15-minute reaction time.

Reactive Sulfide Screen

1. This testing is to be performed on all alkaline samples.
2. Aqueous Liquids- Place 5-10 ml of sample in a test tube. Solids and non aqueous liquids –add 1 gram sample to 10 ml in sodium hydroxide solution.
3. Slowly add enough concentrated Sulfuric Acid to lower the ph to approximately 1. Immediately after adding the acids, hold a wet strip of Lead Acetate paper (moistened with Sodium Hydroxide solution) over the test tube, while agitating the contents.
4. If the paper turns brown or black, report as positive. If the paper does not react, report as negative.

Upon completion of the LIQUID WASTE COMPATIBILITY test, designate on the area in which the DRUMS should be stored prior to transfer or treatment. Retain drum samples for any further testing which may be required.

7.0 CONSOLIDATION/BULKING OPERATIONS

Containerized wastes held in storage may be consolidated with other compatible wastes and repackaged for shipment in drums or in bulk on tank trucks. Liquid bulking operations will be performed in drum staging area, consolidation areas and transportation vehicle storage areas using portable pumps, centrifugal pumps or vacuum trucks. See Table D-9 (Container Handling Activities and Equipment) for open container activities for each storage unit. "Decanting" refers to the pumping of liquids and sludges between containers (i.e. drums and vehicles), and between containers and the bulk storage/treatment tanks. Decanting is an open container activity, which involves the mixing/commingling of compatible waste streams for storage and/or treatment. Decanting is performed using equipment such as the fixed-base drum pumping station inside Building 26, portable pumps system, or vehicle-mounted equipment such as vacuum trucks.

7.1 Acids/Bases

The procedures for removing characteristic hazardous aqueous wastes from containers and transferring the waste into tank trucks, railcars, or into the treatment process are as follows:

1. Wear proper safety equipment, including boots, Tyvek suit or apron, long sleeve shirt, chemical resistant gloves respirator, safety glasses, and hard hat. CONSULT THE FACILITY'S PROTECTIVE EQUIPMENT GUIDE (TABLE F-4) FOR ADDITIONAL REQUIREMENTS SPECIFIC TO THE ACTIVITY.

   a. Receiving Chemists

   1. Aqueous solutions are to be segregated by pH.
   2. All basic materials should be checked for cyanides and sulfides.
   3. Basic materials that off-gas rapidly when acidified must be identified by indicating such on top of the drum in question.
   4. Neutral and basic materials will be pumped together, and corresponding, acidic materials will be pumped together.
   5. Materials received as DOT oxidizers must be properly coded. They will be pumped under direct laboratory and/or receiving chemist supervision.

b. Station Operators

1. Upon direction from the Foreman, one waste code will be pumped at a time.
2. Check to see that the discharge hose is connected and properly secured to the tank truck.
3. Obtain a sample of the tank truck or rail car to be pumped into, and place in a five-gallon bucket.
4. Before each drum is pumped, remove a thief sample and add to the bucket.
5. Observe the addition for signs of reaction, including heat, foaming, offgassing, and/or odor problems.
6. If any problems are noted do not pump, and notify your foreman and/or chemist.
7. If no problems are noted, proceed.
8. Pump into appropriate tank truck.

7.2 Organics/Flammables

The purpose of this operation is to consolidate waste organics and solvents from drums and transfer into tank truck (s), railcars, and/or into storage/treatment tanks.

a. General Procedures

1. Wear proper safety equipment, including safety shoes, Tyvek suit or apron, long sleeve shirt, chemical resistant gloves, FULL-FACE respirator, safety glasses, and hard hat. CONSULT THE FACILITY'S PROTECTIVE EQUIPMENT GUIDE (TABLE F-4) FOR ADDITIONAL REQUIREMENTS SPECIFIC TO THE ACTIVITY.

2. Check system in pump area to insure piping is intact and air is available.

3. Check with the Foreman to determine which tank truck, railcar or tank to pump into.

4. Connect hose and wand to filter IF NEEDED.

5. Obtain 3 or 4 pallets of drums, open bungs on all drums, and attach grounding cable to drum, which will be pumped.

6. Turn on air.

7. Pump all drums then turn off air and check filter.

8. Replace bungs and place empty drums aside. Spray out and remove all labels.

9. Have forklift remove pallets and bring 3 or 4 more skids of solvent.

10. Check for space in tank truck, railcar, or tank. If sufficient space repeat process from Step 5.

b. Clean-Up Procedures

1. Clean filter and inform Foreman if full drum of filtered materials ready for removal.

2. Have forklift bring 1 drum of compatible waste to pump station.

3. Pump drum through clean filter into the selected tank truck, rail car or tank as indicated by Foreman.

4. Clean filter again and place hose and wand into storage area.

5. Check to insure air is off, pump is clean and dry, close valves, check tank.

SOLIDS BULKING

Hazardous and non-hazardous solids in drums, bags, or other containers are bulked into a rolloff container or other suitable dot-approved solids container. Solids bulking is an 'open container' activity on which the containers to be bulked are staged adjacent to the receiving container, lifted by manual or mechanical (e.g., Forklift) means, and then dumped into a polyethylene-line rolloff container or other suitable container.

Bulking of containers into rolloff containers or boxes may occur within designated areas (see Table D-9, Container Handling Activities).

The bulking operator shall be equipped with personal protective equipment (ppe) as specified in the facility's Protective Equipment Guide, Table F-4.

Bulking equipment includes a large capacity forklift equipped with a hydraulic drum tipping attachment. With this attachment, the forklift operator is able to grab, maneuver, and tip drums without leaving the driver's seat. Stubborn or viscous residuals are removed from the drums via manual means, including shaking, tapping, scraping, or rinsing.

Bulking may also be done manually by the operator emptying compatible wastes into a dot-approved container (box). All materials bulked in this manner must be on the list of materials for bulking in boxes (flex bins).

Prior to removing the rolloff or container from building, it shall be visually inspected to verify it contains no obvious free liquids.

Any spillage onto the floor shall be removed immediately. The area shall be inspected to assure that no spillage remains on the floor

8.0 LAB PACK OPERATIONS

8.1 In-Field lab packing Procedures

To insure the integrity and compatibility of all lab packs intended for shipment to CHSI, Clean Harbors has developed a standard protocol for packing lab packs at the generator location. These procedures are to be utilized as a guideline for all CHSI personnel involved in packing operations. A copy of the field packing procedures is attached to this document.

8.2 Receiving Procedures

The contents of all incoming lab packs will be compared with the packing slip to confirm the identity and nature of the materials in the drums. All prescreened unknown lab packs will be compared with the screening analysis to confirm storage and compatibility requirements. All lab packs except prescreened unknown lab packs will be subject to repackaging activities in which the individual containers within the drums are removed and:

1. The containers are repacked (consolidated) into other compatible lab pack drums, or;

2. The contents of the containers are bulked (poured) into 55-gallon drums or the reactor with other compatible material.

All prescreened unknown lab packs will be handled as a hazardous waste and incinerated off-site. Prescreened unknown lab packs will not be repackaged or consolidated on-site.

This operating procedure will cover the ways and means of controlling the receiving of lab pack waste at the Clean Harbors Services, Inc. Facility.

The objective of this procedure is to assure that any lab packs received at the CHSI facility are properly documented and properly packed based on material compatibility.

1. Upon receipt of any lab pack drum at the facility, the documentation accompanying the lab pack should be checked to determine the nature of the materials comprising the lab pack. All lab packs must have an appropriate packing sheet.

2. Any possible incompatibilities should be noted and customer service should be notified so that the customer can be apprised of the problem and informed of the possibility of the need for repacking the lab pack.

3. Once the nature of the material in the lab pack has been determined and any lab pack drum compatibility problems have been clarified or the contents repacked, the storage area should be marked on the lab pack drum and the drum should be moved to that area.

8.3 Repackaging

"Consolidation" refers to the sorting and repacking of individual containers (bottles, jars, etc.) of chemical compatible wastes into a common lab pack container. "Consolidation" is a "closed-container" activity which does not involve any actual mixing of waste streams.

Compatibility is determined through the knowledge of the chemicals (e.g., label information, MSDS's, profile data) and use of standard chemical compatibility charts/references.

"Repackaging" is an "open-container" operation in which the contents of a single container of a hazardous waste are placed into another container of the same size (e.g., from a glass bottle into a polyethylene bottle) or divided into smaller quantities (e.g., 1-gallon container of liquid split into four 1-quart containers). Repackaging does not involve the mixing of waste streams, and only clean/unused containers are used as the receiving container.

The following guidelines are to be adhered to when repackaging lab packs.

1. Proper safety equipment must be worn, including Tyvek suits, safety gloves, full-face respirator, steel-toed boots, neoprene gloves or surgical latex gloves. CONSULT THE FACILITY'S PROTECTIVE EQUIPMENT GUIDE (TABLE F-4) FOR ADDITONAL REQUIREMENTS SPECIFIC TO THE ACTIVITY.

2. The packing list for each lab pack must be reviewed prior to the container being opened. Check for chemical composition and compatibility of the wastes, physical state, and waste codes.

3. Repackaging of lab packs will be done only in approved staging and containment areas (e.g. Consolidation stations).

4. Loosen the ring holding down the lab pack lid, and remove ring and lid carefully.

5. Remove the packing material from the lab pack by scooping it out and place it into a holding container.

6. Once some lab packed materials are exposed, carefully remove them and place them into another lab pack containing compatible materials.

7. Add the chemical name, physical state, and waste code to the new packing list.

8. Continue this process until all the materials in the lab pack have been repackaged.

9. The empty lab pack container will be properly cleaned and reused or disposed of.

10. Relabel the lab pack and place in the appropriate storage area with compatible materials.

8.4 Response to Leaks/Spills

In the event of a spill, release, reaction, or any other unexpected consequences encountered during container repacking, the operator shall immediately notify the supervisor on duty. The supervisor shall contact the emergency coordinator and/or health and safety manager who shall 1) assess the situation and determine whether implementation of the contingency plan is required, and 2) reevaluate the acceptability of the waste and appropriate handling procedures and PPE.

The following guidelines are to be adhered to when handling spilled materials due to cracked or broken containers in lab packs.

1. Proper safety equipment must be worn, including suits, safety gloves, full-face respirator, steel-toed boots, Neoprene gloves or surgical latex gloves. CONSULT THE FACILITY'S PROTECTIVE EQUIPMENT GUIDE (TABLE F-4) FOR ADDITIONAL REQUIREMENTS.

2. The cracked or broken container will be careful removed from the lab pack and placed into an overpack container.

3. The overpack container will be properly labeled on the outside indicating the chemical compound being overpacked.

4. Place the overpack into another compatible lab pack and add the chemical name, physical state, and waste code to the packing list for that lab pack.

5. Any contaminated packing material or free liquid in the lab pack which contained the broken container or spilled material will be repackaged, properly labeled, and placed into another lab pack containing compatible materials. These items will be added to the packing list for that lab pack indicating the chemical name, physical state, and waste code.

6. If the material spilled due to the cover being loosened during transit, retighten the cover and wipe off the container.

7. Place the container in another lab pack and add the chemical, physical state, and waste code to the packing list.

8. Follow the procedures for contaminated or free liquid.

9. Any other containers in the lab pack contaminated by the spilled material will be wiped off and placed into another compatible lab pack. Add the chemical name, physical state, and waste code to the packing list.

10. The empty lab pack container will be properly cleaned and reused or disposed. Lab packs are unpacked into a gondola at a Consolidation Station. The gondola is then transferred to the pour-off area by forklift.

POURING OFF

"Pouring off" is an open-container operation in which chemically compatible hazardous wastes from small individual containers (e.g., vials, jars, bottles, etc.) Are poured/mixed into a common bulk container such as 16-gallon kiln, 55 gallon drum or 345 gallon tote tank, or directly into a waste treatment vessel such as the reactors in Process Building 1.

The following guidelines are to be adhered to when pour-off labpacks.

(1) Proper safety equipment must be worn, including suits, gloves, full-face respirator steel-toed boots, and gloves, consult the facility's protective equipment guide (Table F-4) for additional requirements specific to the activity.

(2) The pour-off station fume hood should be operating.

(3) Labpacks poured-off into the reactor (e.g. acids/bases required a minimum 1000 gallon heat sink of material approved by the lab. Labpacks at pour-off stations will be poured into a 55-gallon container.

(4) Containers are moved from the gondola to the pour-off sink or container. The lids are removed and the contents poured into the sink or container.

(5) Empty containers are rinsed with water for inorganic materials.

(6) Empty containers are placed into 55-gallon drums for disposal.

(7) A representative sample is collected from the chamber or container after pour-off is complete.

9.0 VEHICLE MANAGEMENT PLAN

9.1 Truck Storage/Staging Areas

Inbound and outbound shipments of hazardous waste that are manifested to or from CHSI are subject to management in one of ten (10) designated truck staging /storage areas at the facility. These storage/staging areas are equipped with secondary containment features which meet IEPA regulations for containers storage. The typical vehicles are bulk liquids transporters with a capacity of 7,200-gallon capacity and box trailers with a capacity of 88 55-gallon drums, or equivalent.

The designated staging/storage areas for highway vehicles are:

- Existing Loading/Unloading Pad (Unit Q)	Three (3) units
- Existing Loading/Unloading (Unit V)	Three (3) units
- Listed Waste Offloading Pad (Unit X)	Two (2) units
- Ignitable bulk Liquid Trucks Staging Area (Unit 59)	Three (3) units
- Incoming Truck Staging Area (Unit C)	Six (6) units
- Ignitable Bulk Liquid Offloading (Unit 15)	Two (2) units
- Container Loading dock (Unit 62)	Four (4) units
- Truck to Truck Transfer Pad (Unit W)	Four (4) units
- Building 25 Truck Pad (Unit 67)	One (1) unit
- Truck Loading/Unloading Pad (Unit 69)	Two (2) units
	30 units total

In addition, bulk solid storage areas may be used for vehicle parking when not in bulk solids service. These areas included up to 6 units may be parked in the Bulk Solids Storage Pad, up to three vehicles may be parked in the Rolloff Storage Area in the Existing Unloading Area, and one unit inside Building 3. These areas are also equipped with secondary containment features, which meet IEPA regulations for container storage.

Other loaded hazardous waste vehicles that may be onsite for non-storage/staging activities include four vehicles parked and undergoing offloading at the inorganic treatment system offloading pad, one vehicle in the unloading area near the oil system in Building One, and one vehicle in the unloading area under the filter press in Building Two. These trucks must be undergoing active operations while in these areas, or else transferred to the storage/staging areas designated above.

9.2 Rail Car Transfer Operations

CHSI has proposed to construct and operate a Concrete-lined Storage Area for railcar transfer operations. The Railcar Area is located next to the Ignitable Liquids Tank Farm and is sized to accommodate up to two (2) 30,000-gallons rail tank cars.

Waste materials may be transferred from railcar to tank, railcar to truck, railcar to container, railcar to railcar, truck to railcar, container to railcar, or tank to railcar. All material transfer operations are conducted using the Clean Harbors rail/truck standard operating procedures in Attachment 1.

9.3 Onsite Waste Movement

All vehicles onsite shall remain on the posted roadways and obey all traffic signs, speed limits, or other information. Incoming containers are placed in the Staging Areas (i.e., Units R1, R2 and 61) during sampling/analysis and paperwork review procedures. Upon confirmation, drums of compatible wastes are moved to an appropriate segregated storage bay. In general, the movement of drums within a specific storage/containment unit (e.g., from the existing CHSI Staging Area (R1) to the Flammable-2 Bay), shall be accomplished using fork trucks and hand trucks. If a drum must be transported over a non-contained area (e.g., from Unit 61 to Building 25), specially designed self-contained pallets and tie-down straps shall be used to prevent spills and drum tippage. Containers may be transferred between the former CHCI and former CWM, (e.g. from Unit R1 to Unit 61) storage areas using box trucks, flat bed trailers, or other vehicles.

If open top trucks are used, the transferred containers shall be sheltered against precipitation by use of tarps or other similar devices.

The procedure to be used for moving containers in the facility is as follows;

(1) Determine compatible destination bay, which container is to be moved to.

(2A) If within a specific containment unit, the container may be moved using a fork truck, hand truck, or manual means.

(2B) If the container must be transported over a non-contained area. Self-contained pallets and tie down straps must be used to prevent spills and drum tippage.

(2C) If containers must move between former CHSI and former CWM storage areas, box or flatbed trucks shall be used.

Vehicles containing manifested loads of hazardous waste may be parked/stage in designated area which are quipped with adequate secondary containment. The containers shall be loaded in compliance with us dot hazardous material segregation procedures as described in 49CFR 177.848. A drum-by-drum inventory of the lading of each truck shall be maintained through the use of a truck grid sheet (shown in Attachment 2 of Appendix D-2). A completed grid sheet shall be updated whenever a drum is added or removed from the vehicle. The grid sheet shall be maintained in a conspicuous location or near the truck.

Multiple bulk liquid vehicles that are functioning as the primary containment vessels (i.e., vacuum truck, bulk liquid transporters) may be parked in the same vehicle storage unit provided that a compatibility test is conducted to demonstrate that the contents of the vehicle are not incompatible. CHSI shall utilize the compatibility testing procedures (i.e., bucket test) described in section c of the CHSI waste analysis plan. Bulk liquid vehicles carry incompatible liquids may be on the same truck staging area if parked in different (segregated) bays. Ignitable bulk trailers may only be staged/stored in areas equipped with automatic foam fire suppression protection (e.g., ignitable staging area or the ignitable liquid offloading area). A record of lading for each truck shall be maintained through the use of a manifest. The lading record shall be updated whenever waste is added or removed from the vehicle. An up to date record shall be maintained in a conspicuous location on, or near the truck.

9.4 Transfer Facility/Truck to Truck Transfer Operations

Under the hazardous waste transfer facility requirements of 35 IAC 723.112, a hazardous waste transporter who stores manifested shipments of hazardous waste in containers meeting the requirements of 35 IAC 722.130 for a period of ten days or less is not subject to regulations under 35 IAC 702, 703, 724, 725, or 728 with respect to the storage of those wastes.

CHSI currently operates a transfer facility for hazardous waste in containers and tank trucks which are in-transit to facilities other than CHSI. Such vehicles are allowed to stop at the facility for a period of up to 10 days.

In addition, CHSI performs truck-to-truck transfers of waste between in-transit vehicles. Truck to truck transfer activities are accomplished by parking two (2) in-transit trailers either at a loading dock or tailgate-to-tailgate and then directly transferring the container (s) from one vehicle to the other, or transferring bulk liquids or solids from one transport vehicle to another for continuing transport offsite. The containers being transferred are not opened or staged on the loading dock or on the ground during the transfer, HOWEVER THEY MAY BE SAMPLED WITH IN CONTAINED AREAS. Once the transfer is complete, the accompanying manifest (s) are modified to reflect the continuing transport of the transferred containers, and the vehicles continue their shipments to their next intended destination.

CHSI documents all in-transit/truck to truck activities. A copy of the log and drum grid sheet used to track these activities are included in Attachment 2.

APPENDIX D-3

MANUFACTURER'S LITERATURE FOR
MOBILE WASTE COMPACTOR

COMPACTING TECHNOLOGIES INTERNATIONAL
2417 N.W. Thurman • P.O. Box 29046 • Portland, Oregon 97210 • (503) 223-0719 • FAX (503) 223-0873

Installation Instructions

The following is an installation checklist. The procedures below should be followed closely to ensure a successful start up.

1. Move the machine to the area where it will be used. It weighs approximately 3000 pounds and can be tipped up to forty-five degrees. Facing the machine, the best side to tip it toward is the right. If the machine is to be tipped more than twenty degrees, about one-half of the hydraulic fluid should be drained to prevent leakage and then replaced after the machine is moved to its area of use.

2. Electricity should be hooked up by an electrician familiar with local codes. The necessary voltage and circuit breaker ratings are specified in the e[illegible] section of this manual.

For three phase machines, four wires (three for the current, one for the ground) should be run through the top junction box at the rear of the machine to the main circuit breaker in the electrical panel. The machine is equipped with a disconnect switch, a main circuit breaker, a circuit breaker for the motor, and control circuit fuses.

On three phase machines, when the machine is first started the rotation of the motor must be checked. One person should look down on the top of the motor while another starts the machine. The motor should rotate clockwise. If not, switch any two of the current wires on the main circuit breaker. Prolonged use of the motor (more than 30 seconds) in the wrong direction will destroy the pump.

For single phase machines, three wires (neutral, hot, and ground) are run through the top junction box to the main circuit breaker in the electrical panel. The machine is equipped with a disconnect switch, a main circuit breaker, a circuit breaker for the motor, and control circuit fuses.

There is no need to check the motor rotation on single phase machines.

3. It is highly recommended that new barrels that meet the specifications as outlined in the drawing located in this section be used. The CTI PRO's compaction chamber is designed to support the barrel on the sides and bottom during compaction to minimize distortion. Because of the tight tolerances, larger barrels will not fit in the compaction chamber. Nearly every barrel vendor

will supply barrels this size if specified when ordering.

4. The PRO is shipped with hydraulic oil in it and the platen the down position. As a result, all of the oil is in the hydrau cylinder and not in the hydraulic tank. The gauge will read em until the platen is raised.

5. For machines with HEPA filters, a qualified electrician ne to run wire from the terminal block marked "M2" in the electri panel through the lower junction box in the rear of the machine the HEPA filter blower motor.

6. For machines with liquid removal, the customer must supply to the pump. Between 90 psi and 150 psi should be attached to bulkhead fitting at the rear of the machine. It is best to sup the air from a quarter-inch line. There is also a one half i threaded pipe at the rear of the machine for the discharge from pump. The user must provide for the appropriate disposal for liquid removed.

7. For machines with nitrogen purge, the customer must supply inert gas to the 1/2" fitting on the back of the machine. controller will open and shut the valve as appropriate dur compaction. The compactor cannot sense if there is an inert flow, so the buyer may wish to use an in-line air gauge.

OPERATION PROCEDURES - C.T.I. "PRO" COMPACTION SYSTEM

IMPORTANT - PLEASE READ:
Only personnel trained and familiarized with this unit should attempt operation. If you are not familiar and/or have not received training in the operating procedures, not attempt to operate this system. see your Supervisor, Safety officer for further information.

1. Before operating machine, check that you are wearing appropriate safety garments and equipment.

2. Familiarize yourself with the machine controls. See attached list of machine controls and indicator lights. Also, read and understand complete operating procedures.

3. Obtain key for "control power switch". Insert key and activate switch by rotating to "on" position. "Control p on" lamp should now be illuminated. If lamp is not lit a turning key switch, check to see that electrical disconn switch (on upper right side of the electrical control cabinet) is in the "on" position. If lamp is still not l contact the in-house electrical department for service.

DO NOT ATTEMPT ANY ELECTRICAL MAINTENANCE UNLESS TRAINED AUTHORIZED.

4. Open compactor chamber door by unlatching and rotatin door handle one quarter turn. Visually check for any out-of-place waste material.

5. Using C.T.I. safety handtruck (or similar loading device) place empty barrel/drum inside empty chamber fir onto the bottom anvil and snugly against chamber walls.

6. Place waste into barrel/drum with material (not to ex top of the barrel/drum) correctly inserted.

7. Close door and insure that the locking handle is in t downward locked position. The "door closed" indicator la should now be lit. If light is not showing, resecure doo latch and/or quick shuts door.

NOTE: Machine cannot be operated until the "door closed" lamp shows lit.

8. Initiate automatic compaction cycle by depressing t "auto start" button. This will automatically begin compaction cycle. Microprocessor will control downstro the platen into chamber and return platen to its origi position at the end of the cycle. "Ram position" indic lamps will identify exact position of the platen (eith or down) during the cycle.

NOTE: Compaction cycle automatically stops if compacto is fractionally opened at any time during compaction c If this occurs:

a. Resecure door latch.

b. The "auto start" control must be depressed. The RAM return the platen to it's starting position.

c. The system may now be operated.

9. The machine will then automatically shut-off and is for the loading of additional waste into the drum afte door/quick chute is opened.

10. Authorized waste may be loaded and compacted until predetermined limit is reached and the "drum full" lam illuminated. Full drum-barrel must be removed from the compaction chamber by C.T.I. safety handtruck (or simi device). The system will not operate once the "drum fu lamp is lit.

11. The system must reset as described above in a.,b. and d.,) before a new drum/barrel is placed inside the compaction chamber

12. Full drums/barrels must be stored, labeled and/or manifested according to company procedures.

NOTE: IF YOU DO NOT FULLY UNDERSTAND ANY OF THESE OPER PROCEDURES, PLEASE ASK YOUR SUPERVISOR OR SAFETY OFFIC

NEVER ATTEMPT ANY SERVICE TO THE C.T.I. SYSTEM UNLESS ARE AUTHORIZED AND TRAINED.

This listing will describe the control push buttons lo on the main control enclosure or in a remote control enclosure. Additional controls required for custom sys will be noted following the general descriptions.

CONTROL POWER - This key-activated switch controls pow the entire system. The exception is the programmable controller which requires a continuous power supply an a remote line switch.

CONTROL POWER ON - This lamp indicates that Control Po key is in the "on" position and the system is receivin power.

AUTO START - Push this switch to activate your C.T.I. system for a complete compaction cycle.

AUTO STOP - Push this switch to stop the automatic compaction cycle. The platen will return to the home position when AUTO CYCLE START is pushed again. Once t platen has returned to the home position, push AUTO CY START to activate the full cycle process.

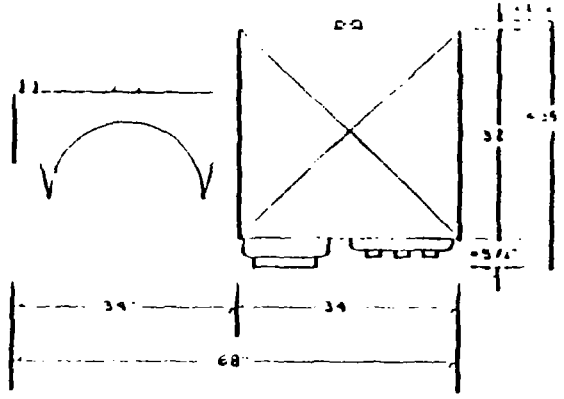
RAM UP LIGHT - This light indicates that the automatic has been completed and the RAM assembly is on its way to a locked position. When this light has gone off, th door or quick chute may be open.

RAM DOWN LIGHT - This light indicates that the automat cycle is in progress and that the platen is in the proc of engaging/compacting the waste in the barrel. The ma door and quick chute may not be opened at this time. I opening the doors is attempted, the machine will shut d until the doors have been secured.

QUICK DISCONNECT LIGHT - Pulling down on this switch wi disconnect all power to the "Pro" system. Power can be restored by putting the switch back in the upright posi

BARREL FULL LIGHT - This light is activated when materi the barrel has reached a present level (which is adjustable). When this light is on, the AUTO CYCLE STAR inoperative.
Note: When the BARREL FULL LIGHT is activated, the AUTO CYCLE START is deactivated until it is reset by turning CONTROL POWER (key operated switch) to the off position After removing the full barrel, turn the key to the on position and begin using the machine as you normally wo

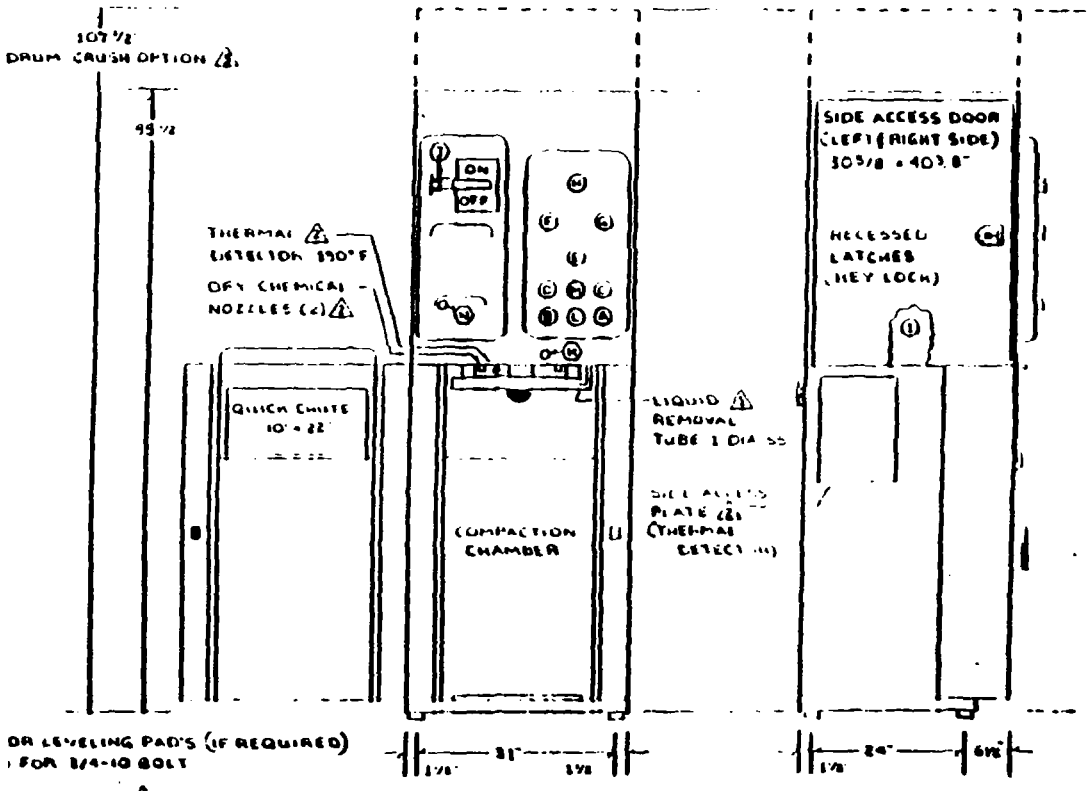
DOOR CLOSED INDICATOR LIGHT - This is lit when the main and/or "Quick Chute" doors are closed and the power is If the light does not come on, and these conditions hav not been met, please resecure the doors.



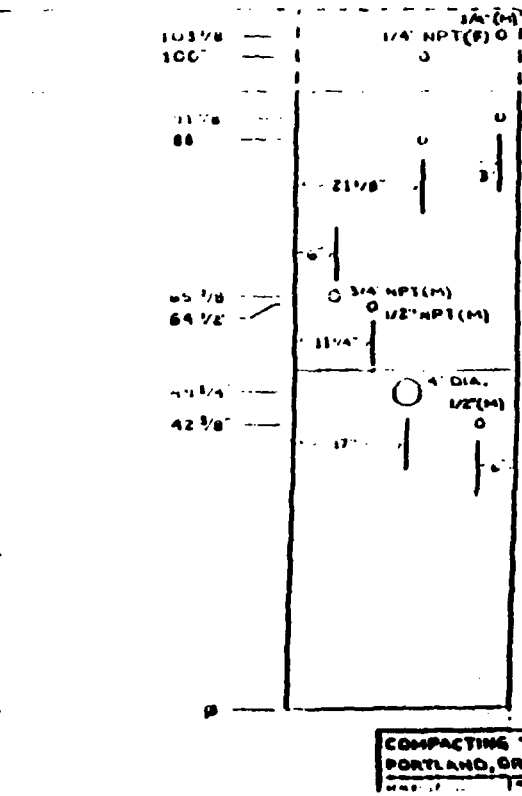
COMPACTOR ELECTRICAL CONTROLS, INDICATORS & SENSORS

KEY	DESCRIPTION	TYPE
A	CONTROL PWR "ON-OFF"	2 POS. KEY OPERATED SELECTOR SWITCH
B	AUTO STOP	MUSHROOM HEAD PUSH BUTTON-RED
C	CONTROL PWR INDICATOR	RED LIGHT
D	AUTO START	ILLUMINATED PUSH BUTTON-GREEN
E	DOOR CLOSED INDICATOR	WHITE LIGHT
F	RAM UP INDICATOR	BLUE LIGHT
G	RAM DOWN INDICATOR	BLUE LIGHT
H	BARREL FULL INDICATOR	FLASHING AMBER LIGHT
I	RAM "UP-DOWN"	3 POS. SELECTOR SWITCH
J	MAIN CIRCUIT BREAKER	LEVER HANDLE "ON-OFF/RESET"
K	DOOR SENSOR (LS-B)	PROXIMITY SWITCH
L	CYCLE "WET-DRY"	2 POS. SELECTOR SWITCH ⚠
M	SUCTION PUMP TEST	PUSH BUTTON-BLUE ⚠
N	HYD. MOTOR STARTER RESET	PUSH BUTTON

FRONT VIEW-DOOR OPEN



LEFT SIDE VIEW-DOOR CLOSED

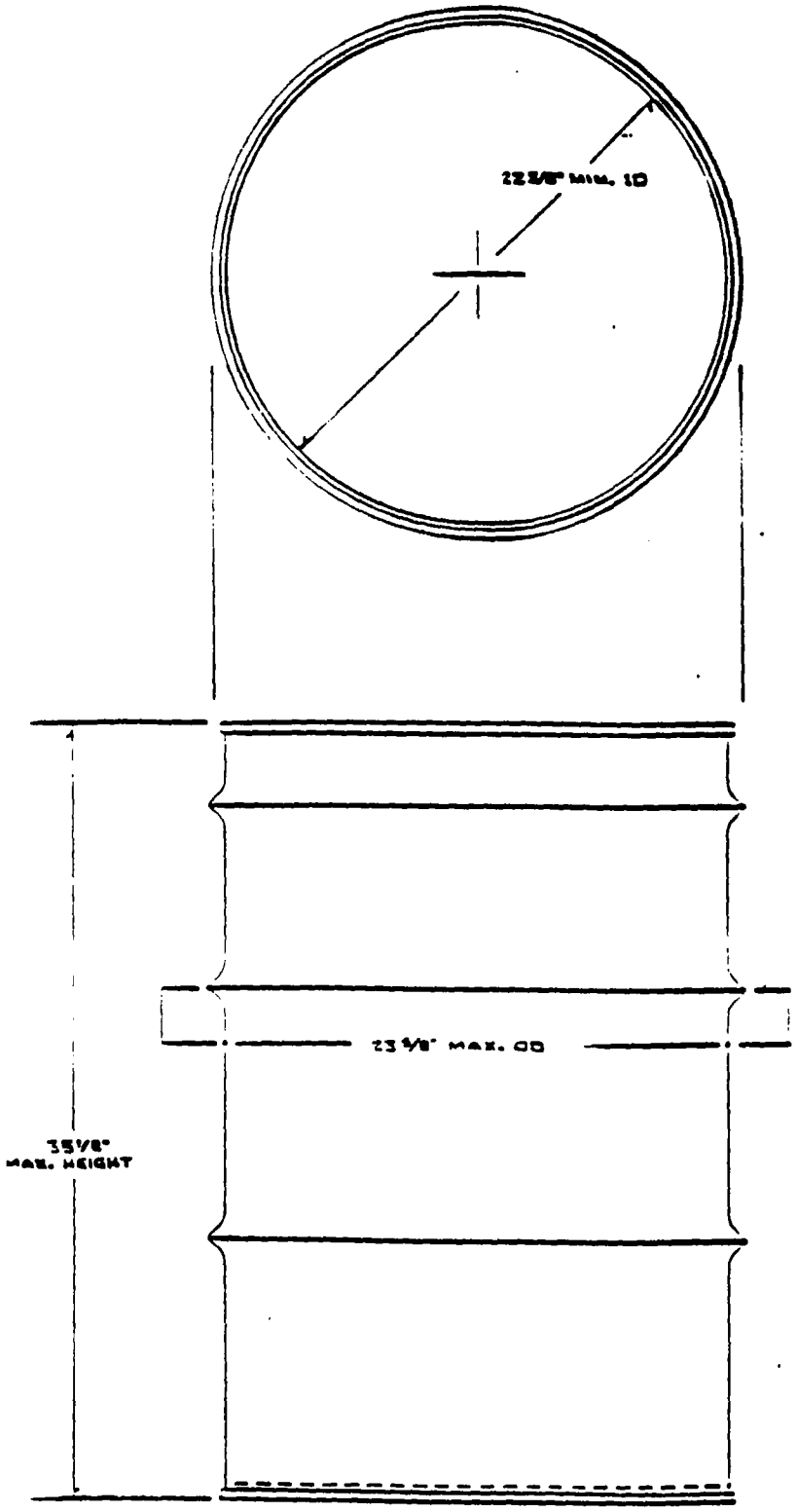


BACK VIEW-DOOR CLOSED

DR LEVELING PAD'S (IF REQUIRED)
FOR 3/4-10 BOLT

OPTIONS: ⚠ LIQUID REMOVAL SYSTEM

COMPACTING TECHNOLOGIES INT'L, CO.
PORTLAND, OR USA



NOTE: OPEN HEAD STEEL DRUM SHALL MEET DOT SPECIFICATIONS FOR HAZARDOUS WASTE. DOT NO. 17C/17H

COMPACTING TECHNOLOGIES INTERNATIONAL

COMPACTING TECHNOLOGIES INT'L, CO
PORTLAND, OR USA

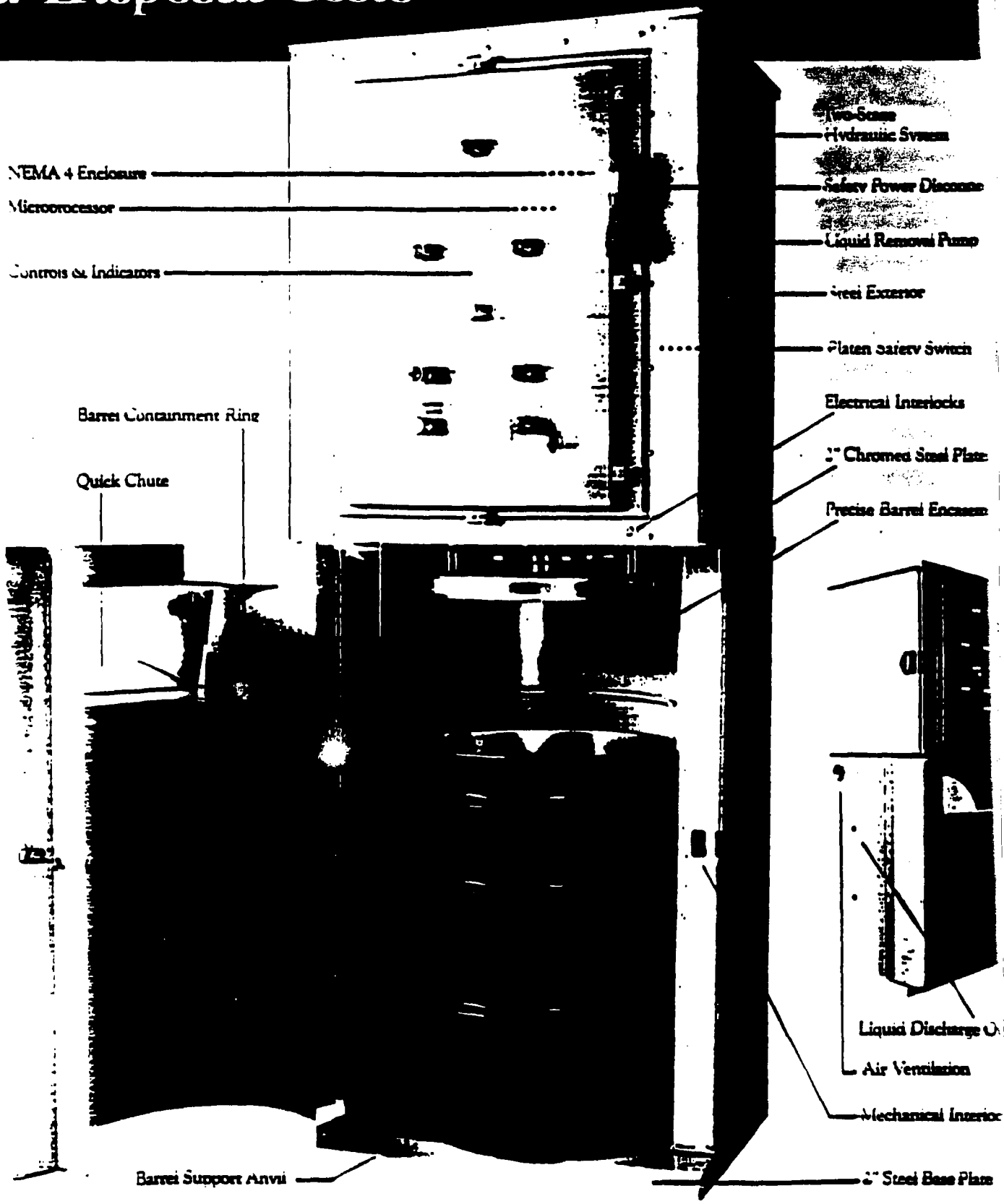
OPEN HEAD STEEL DRUM SPECIFICATIO
FOR CTI PRO-11500 SERIES COMPACTO

DOT NO. 17C/17H

CTI-

OMPACTOR

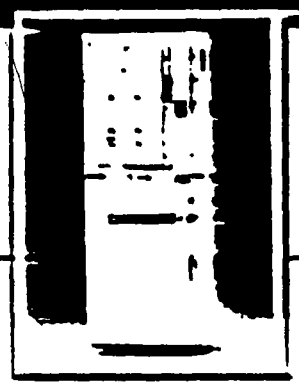
Your Disposal Costs



CTI "PRO"
WASTE PACKAGING SYSTE

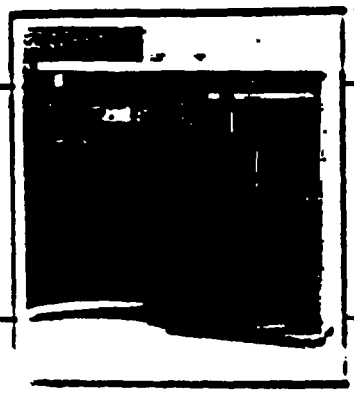
HOW IT WORKS:

1



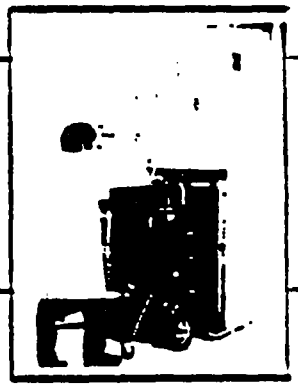
The CTI "PRO" is safe and simple to operate. The fully enclosed, microprocessor controlled system provides the industry's best volume reduction ratios.

2



The patented barrel containment cha completely surrounds and supports th barrel (top, bottom and sides), preven any distortion.

3



The CTI "PRO" allows compaction into steel, fibre or poly/plastic barrels (5 gallon to 55 gallon).

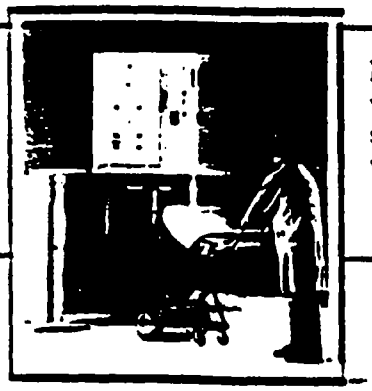
4

The exclusive "Quick Chute," allows waste without opening the c door.

5

Simple one touch operation starts the compaction cycle, while system indicator lights show the status of other machine functions. Quality design and engineering ensures operator safety at all times.

6



Barrel loading and removal is made safe and easy with the "Safety Hand Truck." The unique braking system and 1,000 lb. capacity enable it to handle virtually any load.

COMPACTION TECHNOLOGIES INC.

2417 N.W. Thurman, Portland, OR U.S.A. 9
1-800-727-2067 (503) 228-0719 FAX (503) 228-

THE BETTER TECHNOLOGY

CTI "PRO"

The Better Way To R

A Better Way

Daily disposal of hazardous waste is expensive and difficult in today's environmentally conscious world. At CTI, we have a better way.

The CTI PRO 8500 Compaction System is a better way for hazardous and bio-hazardous waste disposal. Hazardous material is compacted for disposal in steel drums. Fiber drums are used for materials to be incinerated. A microprocessor controlled system delivers the compaction force you need. The PRO's barrel containment chamber and patented compaction system is a safe, smart, sensible way to dispose of waste material.

Safe

The PRO's patented compaction system sets the standard for compaction safety. With proper operation, user safety is assured. The CTI PRO unit will not operate if the door is open. Designed and built to meet or exceed Codes governing compactors.

All electrical components are U.L. listed and are mounted in NEMA 4 or NEMA 7 enclosures.

Hazardous wastes are safely contained during compaction cycles within the barrel containment chamber.

Smart

Microprocessor Controlled

The PRO's unique microprocessor controlled system allows variable cycles resulting in better compaction ratios, thus minimizing disposal costs.

Barrel Containment

Barrels are completely surrounded in a high grade steel barrel containment chamber. The fully encased barrel allows higher compaction ratios without barrel distortion.

Patented "Quick Chute"

"Quick Chutes" front access permits loading of the compactor without opening the door. Rear mounted "Quick Chutes" also available for installation out of frame patterns.

Easy-To-Operate

The PRO features simple one-touch operation. No special training is necessary.

The "Quiet" Compactor

The PRO's fully enclosed design operates quietly in your workplace. (Approximately 55 dbs.)

Sensible

Just 8 feet tall, less than 3 feet wide, and weighing only 2,800 pounds, the PRO is a compact compactor. The innovative two-stage hydraulic system utilizes one-fifth the hydraulic oil of conventional units. The energy efficient 2 hp motor easily adapts to power sources readily available. When in place, the entire unit covers less than nine sq. feet of floor space.

Backed by Commitment to Quality & Service

CTI responds to your needs... before and after purchase. We work with you to guarantee that each and every system performs to specification and your satisfaction. Our technical and service staffs are dedicated to prompt action and response.

Reliable

Each compactor is subjected to a rigid and extensive final factory test procedure. Testing includes full pressure, multi-cycle operation.

Available Options Your Special Need

◆ **Explosion-Proof Design**
Class I, Division I electrical, hydr motor components meet or exceed NFPA guidelines to conform to NI standards.

◆ **Liquid Waste Removal**
A powerful pump efficiently remov during compaction cycle.

◆ **Increased Compaction Ratios**
A larger cylinder allows increased ton pressure to 65,000 lbs. for ever compaction ratios.

◆ **HEPA Filter**
Microprocessor controlled nuclear filtration system removes particles 0.3 microns with 99.97% efficien

◆ **HEPA/Carbon Filtration Syst**
Carbon absorber removes fumes a radioactive iodine down to 0.3 mi with 99.97% efficiency.

◆ **Fire Extinguisher Systems**
Electronic temperature probe and permit connection to existing dry fire extinguishing systems.

◆ **Stainless Steel Components**
Grade 304 stainless steel construc desirable in corrosive or radioactiv environments for ease of wipedow

◆ **Barrel Crushing Configuratio**
Custom hydraulics and a special p insert are used for crushing barrel

◆ **Right-Hand Hinged Door**
Main door hinge can be reversed t modate unit positioning.

◆ **Rear Mounted "Quick Chute**
Rear loading feature allows unit pl out of frame patterns.

◆ **Hand Truck**
Designed specifically for the CTI

Note: CTI engineering department c custom requirements on request.

SPECIFICATIONS

(Based on the CTI "PRO"—8500 Series)

Height: 96"
Width: 34"
Depth: 34"
Weight: 2,800 lbs. (approx.)
Capacity: 55 gallon barrel
Compaction Force: Up to 65,000 lbs.
Electric Motor: 2.0 hp (TEFC)
Electrical Service: Voltage available for most types of service.
Normal Operating Sound Level: 55 dbs.
Hydraulic Fluid: 10 gallons
Warranty: 1 year limited

APPLICATIONS

- Industrial Processing Plants
- Energy Production Facilities
- Hospitals and Clinics
- Government Applications
- High-Tech and Electronics
- Treatment Storage and Disposal Facilities (TSDF)
- Recycling and Maritime Operations
- Research and Development Facilities

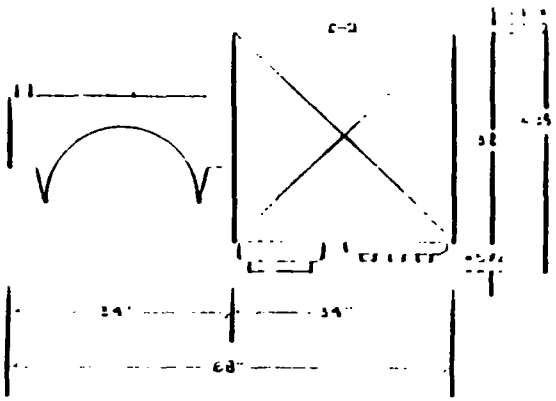
COMPACTION RATIOS

Uncompacted Waste (barrels): CTI "PRO" 8500 compacted waste (barrel)

WASTE TYPE	COMPACTION RATIO RANGES
Absorbent Socks/Pillows	3:1 - 6:1
Oil Filters, cartridge type	3:1 - 8:1
Paint Booth Air Filters	4:1 - 10:1
Glass Laboratory Vials	5:1 - 12:1
Shop Rags, cloth	6:1 - 14:1
Lab Garments, booties/gloves/plastics/etc.	6:1 - 14:1
Metal Buckets, 5 gal.	5:1 - 14:1
Aluminum Containers	8:1 - 20:1
Wiping Towels, paper	20:1 - 25:1

Data collected from CTI manufacturing facility and field results of current users. All ratios are approximate.

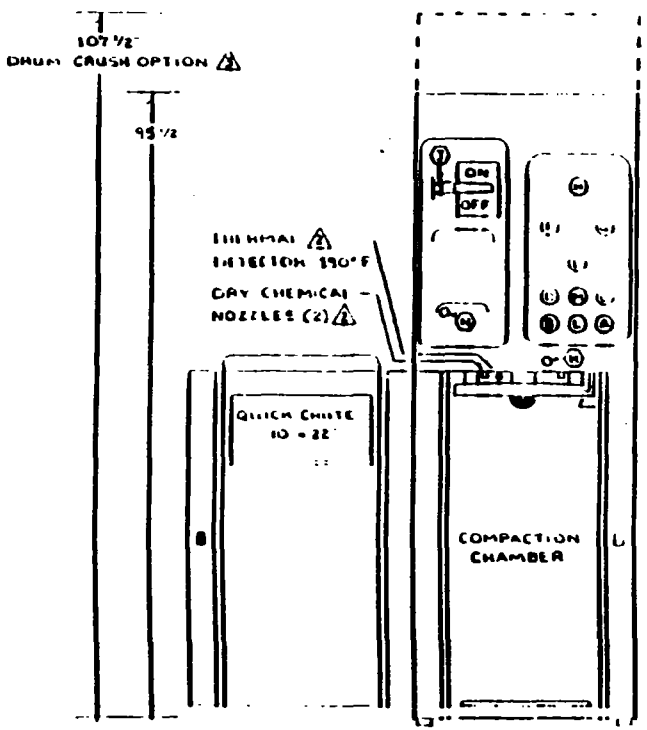
COMPACTING TECHNOLOGIES INTERNATIONAL



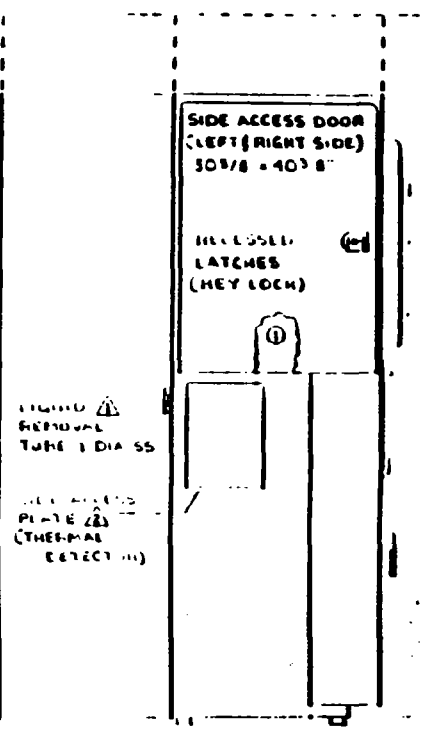
COMPACTOR ELECTRICAL CONTROLS, INDICATORS & SENSORS

REF.	DESCRIPTION	TYPE
A	CONTROL POWER OFF-ON	2 POS. KEY OPERATED SELECTOR SWITCH
B	AUTO STOP	MUSHROOM HEAD PUSH BUTTON-RED
C	CONTROL POWER INDICATOR	RED LIGHT
D	AUTO START	ILLUMINATED PUSH BUTTON-GREEN
E	DOOR CLOSED INDICATOR	WHITE LIGHT
F	RAM UP INDICATOR	BLUE LIGHT
G	RAM DOWN INDICATOR	BLUE LIGHT
H	BARREL FULL INDICATOR	FLASHING AMBER LIGHT
I	RAM UP-DOWN	3 POS. SELECTOR SWITCH
J	MAIN CIRCUIT BREAKER	LEVER HANDLE "ON-OFF/RESET"
K	DOOR SENSOR (LS-5)	PROXIMITY SWITCH
L	CYCLE WET-DRY	2 POS. SELECTOR SWITCH ⚠
M	SUCTION PUMP TEST	PUSH BUTTON-BLUE ⚠
N	HYD MOTOR STARTER RESET	PUSH BUTTON

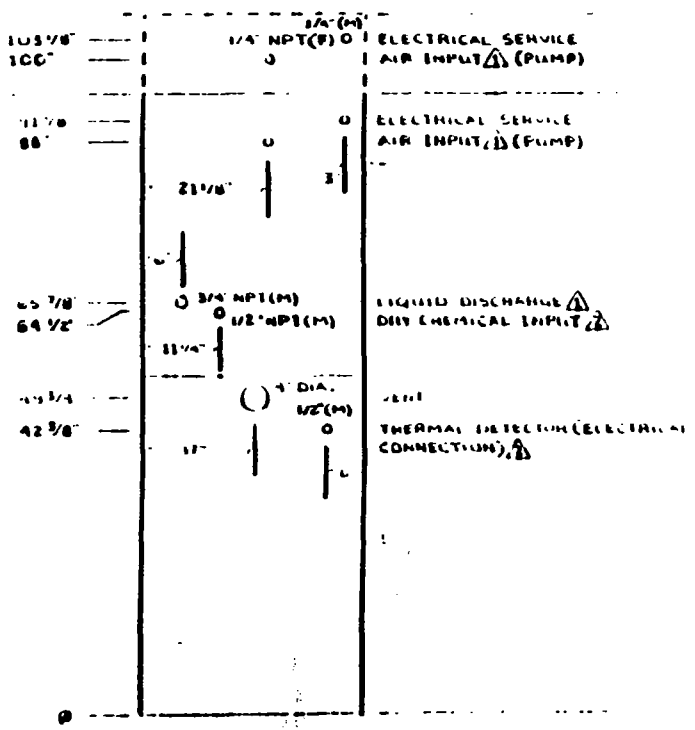
FRONT VIEW-DOOR OPEN



LEFT SIDE VIEW-DOOR CLOSED



BACK VIEW-DOOR CLOSED



DIM'S FOR LEVELING PADS (IF REQUIRED)
TAPPED FOR 3/4-10 BOLT

OPTIONS: ⚠ LIQUID REMOVAL SYSTEM
⚠ FIRE EXTINGUISHER SYSTEM CONNECTION
⚠ DRUM CRUSH

COMPACTING TECHNOLOGIES

COMPACTING TECHNOLOGIES INT'L, CO.
PORTLAND, OR USA
DRAWN: [illegible] | CHECKED: | DRAWING NO: H2
DATE: 1-17-90 | REVISED:
CTI PRO COMPACTOR-ELECTRICAL CONTROL &

CLEAN HARBORS, INC.
HEALTH & SAFETY GUIDELINES
WORK PLAN
PREPARED FOR:

Treatment of Acid Cyanides

CLEAN HARBORS OF CHICAGO, INC.
11800 SOUTH STONY ISLAND AVENUE
CHICAGO, IL 60617

SAFETY GUIDELINES

I. EQUIPMENT

A. 3M Pads
B. Speedi Dry
C. Overpack Jars
D. Poly Bags
F. Class ABC Fire Extinguisher
G. Duct Tape
H. Water
I. Personal protective equipment (Poly coated tyvek, PVC gloves, full face air purifying respirators, chicken boots)

II. WORK AREA SET-UP

A) Materials/Operations Location

Perform work in outside container storage area in the staging bay/truck unloading dock

B) Spill Containment

Area has built in containment per permit

C) Warning Signs

Not applicable.

D) Decon Area

Decon in work area after operation is complete.

III. EMPLOYEE BRIEFING

The following information shall be discussed with the crew performing the operation by the Crew Supervisor with assistance from Health and Safety (if necessary):

A. Emergency response for spills, fire, reactions, or employee exposure to chemicals

B. Health Effects/Signs, Symptoms of Exposure

C. Work Plan Contents

D. Material Data Sheets

E. Exposure Limits

TABLE I

	ppm	mg/m³
ACGIH TLV-TWA [a]		
ACGIH TLV-STEL [b]		
OSHA PEL [c]		
OSHA STEL [d]		
IDHL		

* To be completed by Health & Safety represenatative per appropriate cyanide compound

Additional Information:

Highly toxic hydrogen cyanide will release from liquids with a pH below 8

Appearance:

Liquids of varying color.

Odor:

Faint almond.

Short Term Exposure:

See attached

Long Term Exposure:

See attached.

(FOR FURTHER INFORMATION, REFER TO MSDS OR CONTACT CLEAN HARBORS' HEALTH AND SAFETY DEPARTMENT)

NOTES:

a - TLV-TWA	ACGIH, Threshold Limit Value - Time Weighted Average;
b - TLV-STEL	ACGIH, Threshold Limit Value - Short Term Exposure Limit;
c - PEL-TWA	OSHA, Permissible Exposure Limit - Time Weighted Average;
d - PEL-STEL	OSHA, Permissible Exposure Limit - Short Term Exposure Limit;
e - IDLH	NIOSH, Immediately Dangerous to Life or Health; a maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without experiencing any escape-impairing or irreversible health effects.
f - A 1	ACGIH, Known Human Carcinogen;
g - A 2	ACGIH, Suspected Human Carcinogen;
h - SKIN	This attention calling designation refers to the potential contribution to the overall exposure through skin absorption, including mucous membranes and eyes, either airborne or through direct contact with the substance.
i - CEILING	ACGIH, The concentration that should not be exceeded during any part of the working exposure.

IV. PERSONAL PROTECTIVE EQUIPMENT (PPE)

To ensure the well being of Clean Harbors employees, all employees opening containers must be in Level B protection.

A. PPE Selection

The selection of PPE is based upon the hazards of the materials and the lack of exposure data for the operations. Therefore, the work shall be performed in level B protection.

Level B includes:

a) Full-face supplied air respirator or SCBA in pressure demand mode

b) Saranex or Barricade, chemical resistant coverall

c) Disposable inner gloves (latex)

d) PVA, Butyl or Silver Shield chemical resistant outer gloves

e) Chicken boots

f) Steel toe work boots

B. Action Levels

To ensure the well being of Clean Harbors employees, all acid cyanide operations shall be completed in level B protection.

Level B Action Levels

If any of the following levels are exceeded, Level B operations shall stop immediately and personnel shall immediately leave the work area.

1) Lower explosive limits are above 10%

2) Oxygen content is below 19.5% or above 22.0%

3) Employees experience symptoms of acid cyanide exposure

4) OVA readings of 10 X background are observed

V. CONTROL MEASURES OPERATION PROCEDURES

A) Engineering Controls

Provide ventilation

B) Work Practices

1. Find compatible neutralizing agent.
2. Load container/tanker with excess neutralizing agent.
3. Move container to dock fume hood.
4. Carefully resample drum.
5. Recheck compatability with sample and neutralizing agent sample. Watch carefully for heat rise or gas evolution.
6. Slowly pump contents of container into excess neutralizing agent.
7. Sample mixture and test pH and releasing cyanide
8. If necessary, add additional neutralizing agent.

C) Standard Work Practices

1. Clean Harbors' Standard Safety Precautions/Work Practices shall be followed at all times to ensure contaminant concentrations and potential employee exposures are maintained as low as feasible.

2. When applicable, CHI's Lock-out/Tag-out Guidance Program shall be used to control hazardous energy sources. A copy of CHI's Lock-out/Tag-out Procedures is available.

3. Electrical power for lighting and other equipment will be protected by a GFCI.

4. Clean Harbors procedures for work in flammable atmospheres must be followed at all times.

5. Clean Harbors hot work guidance procedures will be followed during the operation of non-explosion proof equipment.

6. On-site personnel shall don all appropriate/specified PPE prior to commencement of operations.

7. CHI heat stress program will be followed in order to reduce the potential for dehydration. The on-site daily safety meetings shall discuss the hazards of heat stress.

8. Hazards associated with slips, trips, and falls shall be controlled by use of good housekeeping practices and buddy system.

9. On-site personnel shall follow all specified CHI personnel decontamination procedures. All on-site personnel shall shower at the end of the work shift and/or prior to leaving the work area. No employee shall leave the work site with contaminated clothing or equipment.

10. No eating, drinking, or smoking, and/or applying cosmetics.

VI. EXPOSURE MONITORING

Monitoring Equipment:

___ HNu
___ OVA
_X_ Detector Tubes
___ Personal Sampling Pump w/sorbent tubes
___ OVM
___ O2/CGM
___ Photovac
___ Hg vapor Analyzer
___ Other

The Supervisor will be responsible for ensuring adequate air monitoring is conducted and that adequate personnel protection and site integrity are maintained.

Results from Direct Reading monitoring instruments must be recorded on a Clean Harbors' Health and Safety Atmospheric Monitoring Log. Records of monitoring results will be maintained in Chicago Monitoring Results File.

The combustible gas meter should be used when handling flammable liquids.

VII. CONTINGENCY PLAN

The following procedures should be followed in the event of a fire, spill reaction, or employee exposure.

A. An ABC fire extinguisher can be used to fight a fire in its incipient stage. In the event of a fire evacuate the facility and activate the facility contingency plan. Notify an Emergency Coordinator, the Compliance Manager and Health and Safety even if the fire is extinguished immediately.

B. In the event of a spill, Speedi Dry can be used to absorb liquids. Notify an Emergency Coordinator, the Compliance Manager, and Health and Safety.

C. In the event of a reaction, halt all operations and notify an Emergency Coordinator, the Compliance Manager, and Health and Safety.

D. In the event of an employee exposure flush area with water for 15 minutes and notify an Emergency Coordinator, the Compliance Manager, and Health and Safety.

VIII. CLEAN-UP/DECONTAMINATION

Decon should proceed as follows:

A. Exit work area to PPE doffing areas. Remove protective clothing, outer gloves, and boots. Unroll protective suit carefully to prevent contamination of employee uniform. Continue to wear respirators until all other PPE is removed and you are at the door

B. Place removed protective clothing in receptable labeled for disposal.

C. Respiratory protection equipment shall be removed, cleaned, and disinfected in decon buckets. Inner gloves shall be worn during this procedure.

I have read and understand the contents of this work plan, and have had all relevant questions answered to my satisfaction. In addition, I agree to comply with the conditions/provisions outlined therein:

NAME (PRINT)	SIGNATURE	DATE

APPENDIX D-5

STANDARD OPERATING PROCEDURE:
WETTING OF ORGANIC PEROXIDES

CLEAN HARBORS, INC.
HEALTH & SAFETY GUIDELINES
WORK PLAN
PREPARED FOR:

Wetting Lab Pack Organic Peroxides

CLEAN HARBORS OF CHICAGO, INC.
11800 SOUTH STONY ISLAND AVENUE
CHICAGO, IL 60617

SAFETY GUIDELINES

I. EQUIPMENT

A. 3M Pads
B. Speedi Dry
C. Overpack Jars
D. Poly Bags
F. Class ABC Fire Extinguisher
G. Duct Tape
H. Water
I. Personal protective equipment (Poly coated tyvek, PVC gloves, full face air purifying respirators, chicken boots)

II. WORK AREA SET-UP

A) Materials/Operations Location

Perform work in area designated for the consolidation of labpacks under the operating fume hood.

B) Spill Containment

Cover work table with poly. Have Speedy Dri available for liquid spills.

C) Warning Signs

Not applicable.

D) Decon Area

Decon in work area after operation is complete.

III. EMPLOYEE BRIEFING

The following information shall be discussed with the crew performing the operation by the Crew Supervisor with assistance from Health and Safety (if necessary):

A. Emergency response for spills, fire, reactions, or employee exposure to chemicals.

B. Health Effects/Signs, Symptoms of Exposure.

C. Work Plan Contents.

TABLE I

	ppm	mg/m³
ACGIH TLV-TWA [a]		
ACGIH TLV-STEL [b]		5
OSHA PEL [c]		5
OSHA STEL [d]		5

Additional Information:

Organic Peroxides could be shock sensitive if they contain insufficient water. Dry solids are also flammable.

Appearance:

Colorless to white crystals or a granular powder.

Odor:

A faint almond or benzaldehyde-like odor.

Short Term Exposure:

Organic Peroxides are corrosive to tissue. Inhalation, skin contact, or eye contact may result in tissue damage.

Long Term Exposure:

Prolonged or repeated contact may result in inflamation and sensitization dermatitis, conjunctivitis, liver and kidney damage.

(FOR FURTHER INFORMATION, REFER TO MSDS OR CONTACT CLEAN HARBORS' HEALTH AND SAFETY DEPARTMENT)

NOTES:

a - TLV-TWA	ACGIH, Threshold Limit Value - Time Weighted Average;
b - TLV-STEL	ACGIH, Threshold Limit Value - Short Term Exposure Limit;
c - PEL-TWA	OSHA, Permissible Exposure Limit - Time Weighted Average;
d - PEL-STEL	OSHA, Permissible Exposure Limit - Short Term Exposure Limit;
e - IDLH	NIOSH, Immediately Dangerous to Life or Health; a maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without experiencing any escape-impairing or irreversible health effects.
f - A 1	ACGIH, Known Human Carcinogen;
g - A 2	ACGIH, Suspected Human Carcinogen;
h - SKIN	This attention calling designation refers to the potential contribution to the overall exposure through skin absorption, including mucous membranes and eyes, either airborne or through direct contact with the substance.
i - CEILING	ACGIH, The concentration that should not be exceeded during any part of the working exposure.

IV. PERSONAL PROTECTIVE EQUIPMENT (PPE)

To ensure the well being of Clean Harbors employees, all employees opening containers must be in Level B protection.

Only the Clean Harbors' Manager of Occupational Health and Safety can authorize downgrading of personal protective equipment.

Level B includes:

Poly coated tyvek with hood
Chicken boots
Latex gloves
PVC gloves
Full face air supplied respirator

Employees handling closed containers can wear full face air purifying respirators with GMCH cartridges, PVC gloves, and work uniforms.

Other employees present assisting with paperwork or working on other projects can wear Level D protection.

Restrictions:

Level D includes:

Safety glasses
Work uniform
Steel toed boots

V. CONTROL MEASURES OPERATION PROCEDURES

A) Engineering Controls

Fume Hood

B) Work Practices

1. Set up work table covered with poly.
2. Lay out material to be worked on in the work area while ensuring that aisle space is kept clear.
3. Select one pail at a time.
4. Remove contents of pail and repack as follows:
   a. Up to 5 lbs. per one gallon per container. Must be 20% wet with water. Pack in a 55 gallon drum for Ensco.
5. Overpack any container in poor condition into rigid overpack jar.
6. Make sure that containers are packed in plenty of vermiculite to prevent breakage.

C) Standard Work Practices

1. Clean Harbors' Standard Safety Precautions/Work Practices shall be followed at all times to ensure contaminant concentrations and potential employee exposures are maintained as low as feasible.

2. When applicable, CHI's Lock-out/Tag-out Guidance Program shall be used to control hazardous energy sources. A copy of CHI's Lock-out/Tag-out Procedures is available.

3. Electrical power for lighting and other equipment will be protected by a GFCI.

4. Clean Harbors procedures for work in flammable atmospheres must be followed at all times.

5. Clean Harbors hot work guidance procedures will be followed during the operation of non-explosion proof equipment.

6. On-site personnel shall don all appropriate/specified PPE prior to commencement of operations.

7. CHI heat stress program will be followed in order to reduce the potential for dehydration. The on-site daily safety meetings shall discuss the hazards of heat stress.

8. Hazards associated with slips, trips, and falls shall be controlled by use of good housekeeping practices and buddy system.

9. On-site personnel shall follow all specified CHI personnel decontamination procedures. All on-site personnel shall shower at the end of the work shift and/or prior to leaving the work area. No employee shall leave the work site with contaminated clothing or equipment.

10. No eating, drinking, or smoking, and/or applying cosmetics.

VI. EXPOSURE MONITORING

Monitoring Equipment:

----- HNu
----- OVA
----- Detector Tubes
----- Personal Sampling Pump w/sorbent tubes
----- OVM
----- O2/CGM
----- Photovac
----- Hg vapor Analyzer
----- Other

The Supervisor will be responsible for ensuring adequate air monitoring is conducted and that adequate personnel protection and site integrity are maintained.

Results from Direct Reading monitoring instruments must be recorded on a Clean Harbors' Health and Safety Atmospheric Monitoring Log. Records of monitoring results will be maintained in Chicago Monitoring Results File.

The combustible gas meter should be used when handling flammable liquids.

VII. CONTINGENCY PLAN

The following procedures should be followed in the event of a fire, spill reaction, or employee exposure.

A. An ABC fire extinguisher can be used to fight a fire in its incipient stage. In the event of a fire evacuate the facility and activate the facility contingency plan. Notify an Emergency Coordinator, the Compliance Manager and Health and Safety even if the fire is extinguished immediately.

B. In the event of a spill, Speedi Dry can be used to absorb liquids. Notify an Emergency Coordinator, the Compliance Manager, and Health and Safety.

C. In the event of a reaction, halt all operations and notify an Emergency Coordinator, the Compliance Manager, and Health and Safety.

D. In the event of an employee exposure flush area with water for 15 minutes and notify an Emergency Coordinator, the Compliance Manager, and Health and Safety.

VIII. CLEAN-UP/DECONTAMINATION

Decon should proceed as follows:

A. Exit work area to PPE doffing areas. Remove protective clothing, outer gloves, and boots. Unroll protective suit carefully to prevent contamination of employee uniform. Continue to wear respirators until all other PPE is removed and you are at the door

B. Place removed protective clothing in receptable labeled for disposal.

C. Respiratory protection equipment shall be removed, cleaned, and disinfected in decon buckets. Inner gloves shall be worn during this procedure.

I have read and understand the contents of this work plan, and have had all relevant questions answered to my satisfaction. In addition, I agree to comply with the conditions/provisions outlined therein:

NAME (PRINT)	SIGNATURE	DATE

APPENDIX D-6

SAMPLE LABELS/MARKINGS

Clean Harbors Services, Inc.
Labels/Marking

1.0 Labels/Marking

Clean Harbors Services, Inc (CHSI) requires that all shipments of hazardous wastes and hazardous materials received at, or shipped from the facility, meet the US Department of Transportation (D.O.T.) packing/shipping requirements as described in 49 CFR 173 and the labeling and marking requirements of 35 IAC Part 722 Subpart C and 49 CFR 172. Samples of CHSI's preprinted hazardous waste labels and standard DOT markings are shown on Exhibits 1 and 2.

Each container received at the facility is also marked with the date of receipt. The date, which is written directly onto the drum surface with indelible ink, is recorded to ensure compliance with the Land Disposal Restriction (LDR) requirements in 40 CFR 268 regarding storage of LDR wastes for a period of no more than one year.

2.0 Waste Tracking System

CHSI employs a computerized waste tracking system to monitor the ultimate disposition of materials processed at the facility. The key to the system of assigning a unique tracking number for each piece of waste with a corresponding bar code label which is attached to a container or associated with a bulk load.

Upon arrival each load of waste has its shipping information entered into the waste tracking data base. A receiving document is generated and bar code labels are issued for the load. A sample of the CHSI bar code label is shown in Exhibit 3.

The receiving document, which serves as a data record has all of the waste tracking numbers associated with a particular load printed on it. The document is completed as the load is received and contains spaces for entering the following information for each tracking number's waste:

* Manifest Line Number
* Waste Profile Sheet Number
*Clean Harbors Internal Code
* Quantity/Unit of Measure
* Off-Specification Data
* EPA Waste Code Number
*Customer Control Number
* Sample Number
* Physical State
* Miscellaneous Comments

The CHSI laboratory analysis of the waste is entered into the same waste tracking data base against the tracking number of the waste.

Each time a waste is processed at the facility, an entry is made in the database to record that activity. Ultimately, there is a history of each piece of waste received, which is stored in the database and available on any waste received and CHSI.

Exhibit 1
Sample Hazardous Waste Label

U.S. D.O.T. SHIPPING DESCRIPTION
Waste Paint, 3, UN1263, II

3
HAZARD CLASS

HAZARDOUS WASTE

FEDERAL LAW PROHIBITS IMPROPER DISPOSAL
IF FOUND, CONTACT THE NEAREST POLICE, OR PUBLIC SAFETY AUTHORITY, OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY

CAUTION

MANIFEST DOCUMENT # 02889800	ACCUMULATION START DATE 01/08/03
GENERATOR Clean Harbors Services, Inc.	
ADDRESS 11800 S. Stony Island	
CITY Chicago	ST IL / ZIP 60617
EPA ID # ILD000608471	EPA HAZARD NAME Ignitable
EPA WASTE # D001	
PROFILE# HO-368558 / DESCRIPTION	CUST. CONTROL# 3743756

CAUTION

CONTAINS HAZARDOUS OR TOXIC WASTE

HAZARDOUS CONSTITUENTS

PART # HW300W REV 01 3/93

Oxygen generator, chemical, spent

[Revised 04/19/03]

Exhibit 2
Sample Hazardous Waste Marking

Exhibit 3
Sample Bar Code Label

CleanHarbors®
Environmental Services Companies

05/05/03

B36 CONS

CH

This container has been inspected and complies with 40 CFR 264/265 Subpart CC

HAZARDOUS WASTE

PROFILE CH068328B
HAZARD TOXIC
CONST ARSENCI

3869062

CLEAN HARBORS - CHICAGO, IL
OUTBND
TCNLGY DEWATERING
UN/NA NA3082 B36

PROFILE CH068328B
3869062

PROFILE CH068328B
3869062

Response to NOD for Part B

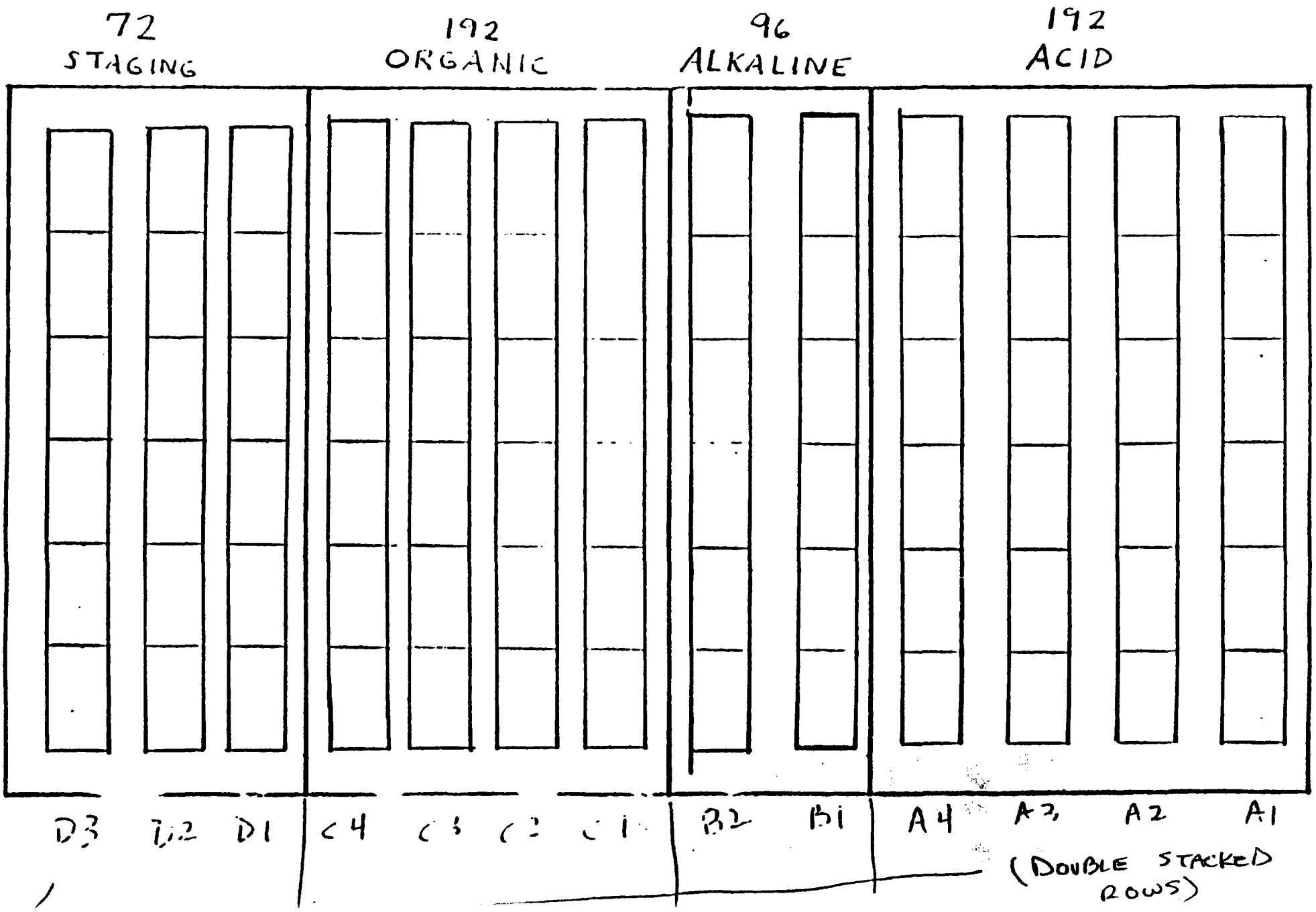
Manual Inventory Tracking System Procedures

An inventory will be performed daily which will tie each container by tracking number to a specific bay, row, and pallet location with the facility (see attached inventory forms).

Each inventory form represents a different permitted storage location within the facility broken down by drum and pallet number. Double stacked aisles will be appropriately accounted.

All inventories will be taken at the beginning of each business day and placed within a log book in our Waste Tracking Department.

The manual system is a back-up to our present computer aided bar-code system and electronic scanning devices.


72
STAGING
192
ORGANIC
96
ALKALINE
192
ACID
D3
D2
D1
C4
C3
C2
C1
B2
B1
A4
A3
A2
A1
(DOUBLE STACKED ROWS)

Acid Bay (Total Capacity = 192)

DATE:

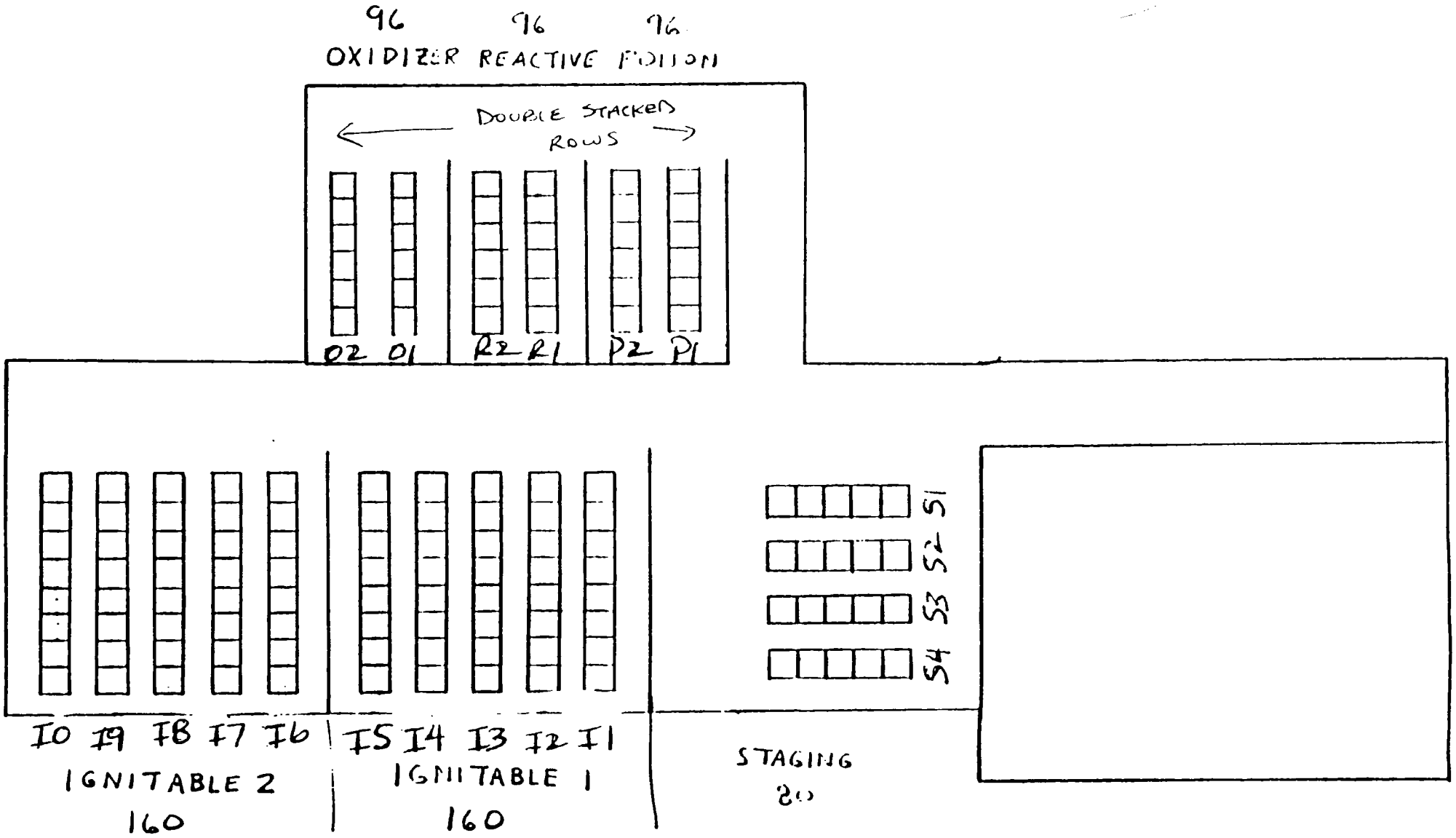
OPERATOR:

25	26	27	28	29	30	31	32	33	34	35	36	(Bot)
48	47	46	45	44	43	42	41	40	39	38	37	
24	23	22	21	20	19	18	17	16	15	14	13	(Top)
1	2	3	4	5	6	7	8	9	10	11	12	

25	26	27	28	29	30	31	32	33	34	35	36	(Bot)
48	47	46	45	44	43	42	41	40	39	38	37	
24	23	22	21	20	19	18	17	16	15	14	13	(Top)
1	2	3	4	5	6	7	8	9	10	11	12	

25	26	27	28	29	30	31	32	33	34	35	36	(Bot)
48	47	46	45	44	43	42	41	40	39	38	37	
24	23	22	21	20	19	18	17	16	15	14	13	(Top)
1	2	3	4	5	6	7	8	9	10	11	12	

25	26	27	28	29	30	31	32	33	34	35	36	(Bot)
48	47	46	45	44	43	42	41	40	39	38	37	
24	23	22	21	20	19	18	17	16	15	14	13	(Top)


96
96
96
OXIDIZER
REACTIVE
FUELS
DOUBLE STACKED ROWS
O2 O1
R2 R1
P2 P1
I0 I9 I8 I7 I6
IGNITABLE 2
160
I5 I4 I3 I2 I1
IGNITABLE 1
160
S1
S2
S3
S4
STAGING
80

Alkaline Bay (Total Capacity = 96)

DATE:

OPERATOR:

25	26	27	28	29	30	31	32	33	34	35	36
48	47	46	45	44	43	42	41	40	39	38	37

24	23	22	21	20	19	18	17	16	15	14	13
1	2	3	4	5	6	7	8	9	10	11	12

25	26	27	28	29	30	31	32	33	34	35	36
48	47	46	45	44	43	42	41	40	39	38	37

24	23	22	21	20	19	18	17	16	15	14	13

Organic Bay (Total Capacity = 192)

DATE:

OPERATOR:

25	26	27	28	29	30	31	32	33	34	35	36	(Bot)
48	47	46	45	44	43	42	41	40	39	38	37	
24	23	22	21	20	19	18	17	16	15	14	13	(Top)
1	2	3	4	5	6	7	8	9	10	11	12	

25	26	27	28	29	30	31	32	33	34	35	36	(Bot)
48	47	46	45	44	43	42	41	40	39	38	37	
24	23	22	21	20	19	18	17	16	15	14	13	(Top)
1	2	3	4	5	6	7	8	9	10	11	12	

25	26	27	28	29	30	31	32	33	34	35	36	(Bot)
48	47	46	45	44	43	42	41	40	39	38	37	
24	23	22	21	20	19	18	17	16	15	14	13	(Top)
1	2	3	4	5	6	7	8	9	10	11	12	

25	26	27	28	29	30	31	32	33	34	35	36	(Bot)
48	47	46	45	44	43	42	41	40	39	38	37	
24	23	22	21	20	19	18	17	16	15	14	13	(Top)

Inside Staging Area (Total Capacity = 72)

DATE:

OPERATOR:

24	23	22	21	20	19	18	17	16	15		
1	2	3	4	5	6	7	8	9	10	11	12

ROW - 03

24	23	22	21	20	19	18	17	16	15		
1	2	3	4	5	6	7	8	9	10	11	12

ROW - 02

24	23	22	21	20	19	18	17	16	15		
1	2	3	4	5	6	7	8	9	10	11	12

ROW - 01

Outside Staging Area (Total Capacity - 80)

DATE:

OPERATOR:

20	19	18	17	16	15	14	13	12	11
1	2	3	4	5	6	7	8	9	10

20	19	18	17	16	15	14	13	12	11
1	2	3	4	5	6	7	8	9	10

20	19	18	17	16	15	14	13	12	11
1	2	3	4	5	6	7	8	9	10

20	19	18	17	16	15	14	13	12	11

Ignitable Bay (Total Capacity = 160)

DATE:

OPERATOR:

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

ROW - 10

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

ROW - 12

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

ROW - 11

Ignitable Bay 2 (Total Capacity = 160)

DATE:

OPERATOR: _____

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

NOW - 10 (random)

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

NOW - 9

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

NOW - 8

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

NOW - 7

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

NOW - 1

Poison Bay (al Capacity = 96)

DATE: ...

OPERATOR: ...

25	26	27	28	29	30	31	32	33	34	35	36
48	47	46	45	44	43	42	41	40	39	38	37

ROW - 1 (Bottom)

24	23	22	21	20	19	18	17	16	15	14	13
1	2	3	4	5	6	7	8	9	10	11	12

ROW - 1 (Top)

25	26	27	28	29	30	31	32	33	34	35	36
48	47	46	45	44	43	42	41	40	39	38	37

ROW - 2 (Bottom)

24	23	22	21	20	19	18	17	16	15	14	13
1	2	3	4	5	6	7	8	9	10	11	12

ROW - 2 (Top)

Reactive Bay (Total Capacity = 96)

DATE: _____

OPERATOR: _____

25	26	27	28	29	30	31	32	33	34	35	36
48	47	46	45	44	43	42	41	40	39	38	37

24	23	22	21	20	19	18	17	16	15	14	13
1	2	3	4	5	6	7	8	9	10	11	12

25	26	27	28	29	30	31	32	33	34	35	36
48	47	46	45	44	43	42	41	40	39	38	37

24	23	22	21	20	19	18	17	16	15	14	13
1	2	3	4	5	6	7	8	9	10	11	12

Oxidizer Ba, .Total Capacity = 96)

DATE:

OPERATOR:

25	26	27	28	29	30	31	32	33	34	35	36
48	47	46	45	44	43	42	41	40	39	38	37

24	23	22	21	20	19	18	17	16	15	14	13
1	2	3	4	5	6	7	8	9	10	11	12

25	26	27	28	29	30	31	32	33	34	35	36
48	47	46	45	44	43	42	41	40	39	38	37

24	23	22	21	20	19	18	17	16	15	14	13
1	2	3	4	5	6	7	8	9	10	11	12

APPENDIX D-7

PROFESSIONAL ENGINEER (PE) ASSESSMENT
AND CERTIFICATION OF THE DESIGN OF
EXISTING AND APPROVED/NOT YET CONSTRUCTED
CONTAINER STORAGE AREAS

HOYER-SCHLESINGER-TURNER inc.
ENGINEERS - CONSTRUCTORS
300 west adams street chicago illinois 60606 telephone 263-0556 area code 312

February 13, 1992

Permit Section, RCRA Unit
Division of Land Pollution Control
Illinois Environmental Protection Agency
P.O. Box 19276
Springfield, Illinois 62794-9276

Re: Clean Harbors of Chicago, Inc.
11800 South Stony Island Avenue
Chicago, Illinois 60617
Revised Part-B Permit Application

Dear Sir or Madam:

Please refer to: 0316000051--Cook County
Clean Harbors of Chicago
ILD000608471
RCRA Permit Log No. 16
RCRA Permit File

I hereby certify that I, the undersigned am a Professional Engineer, Licensed to practice in the State of Illinois in accordance with Ill. Rev. Stat., par. 5101, Sec. 1 and par. 5119, Sec. 13.1.

I certify under penalty of law that the following proposed areas:

- -Outdoor container storage area
- -Lab-pack, re-pack and consolidation area
- -Fuel blending container staging area
- -Process building No. 3

were designed under my direct supervision and the design incorporates good engineering practice.

Containment areas for Outdoor containment storage incorporates into design water stops between slab on grade and canopy foundation. Containment areas for other areas are designed as slab on grade, independent of structural foundations for buildings or canopies. The containment slabs are designed as mat foundations. Optional construction joints in dike walls are sealed with renewable caulk type sealants over closed cell polyethylene foam backer rod. Joints are 6" above floor, so any damage to the joint is visible.

Special low shrinkage concrete mixture is specified on CHCI Dwg. No. 4216. This type of concrete minimizes shrinkage cracking in the containment areas.

It is specifically noted that the use of concrete produced with minimum cement content (flyash substitution), the use of fibers (chopped polypropylene) and made workable by the addition of super plasticizers will minimize shrinkage hence shrinkage cracking.

Prior to coating, the concrete surfaces will be inspected for cracking and remediated if necessary prior to coating.

Floors and dike walls of containment area after moist curing are coated with a monolithic sealant that is chemically compatible with stored waste materials. Technical specifications are listed in Appendix D-18.

Respectfully submitted,

HOYER-SCHLESINGER-TURNER, INC.
Engineers - Constructors

Lee Schlesinger, P.E.
President
Licensed Professional Engineer
Illinois No. 18105
My license expires on 11/30/92

LS/ar

LEE SCHLESINGER
18105
LICENSED
PROFESSIONAL
ENGINEER
OF
ILLINOIS

HOYER-SCHLESINGER-TURNER inc.
ENGINEERS - CONSTRUCTORS
100 west adams street chicago illinois 60606 telephone 263-0556 area code 312

December 11, 1992

Permit Section, RCRA Unit
Division of Land Pollution Control
Illinois Environmental Protection Agency
PO Box 19276
Springfield, Illinois 62794-9276

Re: Clean Harbors of Chicago, Inc.
11800 South Stony Island Avenue
Chicago, Illinois 60617
Revised Part-B Permit Application

Dear Sir or Madam:

Please refer to: 0316000051--Cook County
Clean Harbors of Chicago
ILD000608471
RCRA Permit Log No. 16
RCRA Permit File

I hereby certify that I, the undersigned am a Professional Engineer, license to practice in the State of Illinois.

I certify under penalty of law that the following proposed areas:

-Outdoor container storage area
-Lab-pack, re-pack and consolidation area
-Fuel blending container staging area
-Process building No. 3

were designed under my direct supervision and the design incorporates good eng: neering practice.

The structural design of all areas listed above is suitable for intended us Foundations, floors and containment slabs are designed for intendent load a will maintain structural integrity without failure.

Containment areas for Containers Outdoor Storage incorporates into design wat stops between slab on grade and canopy foundation. Containment areas for oth areas are designed as slab on grade, independent of structural foundations f buildings or canopies. The containment slabs are designed as mat foundation Where perimeter dike walls exceed height of 6", optional construction joi may be used. Construction joints in dike walls are sealed with renewable cau type sealants over closed cell polyethylene foam backer rod. Joints are above floor, so any damage to the joint is visible.

H-S-T

Special low shrinkage concrete mixture is specified on CHCI Dwg. No. 4216, Appendix D-44. This type of concrete minimizes shrinkage cracking in the containment areas.

It is specifically noted that the use of concrete produced with minimum cement content (flyash substitution), the use of fibers (polypropylene fibers) and made workable by the addition of super plasticizers will minimize shrinkage hence shrinkage cracking.

Prior to coating, the concrete surfaces will be inspected for cracking and remediated if necessary prior to coating.

After moist curing, floor and dike walls of all containment areas will be coated with a monolithic, ¼" thick coating material that is chemically compatible with most of the stored waste materials. After careful consideration of all stored chemicals and discussion with coating manufacturer representatives, Protecto-Crete 900 manufactured by Dudick, Inc. was selected as most suitable. Technical specifications are listed in Appendix D-18.

Respectfully submitted,

HOYER-SCHLESINGER-TURNER, INC.
Engineers - Constructors

Marie Vanags

Marie Vanags, PE
Licensed Professional Engineer
Illinois No. 062-040801
My license expires on 11/30/94

MARIE VANAGAS
62-40801
REGISTERED
PROFESSIONAL
ENGINEER
OF
ILLINOIS

MV/ar

HOYER-SCHLESINGER-TURNER inc.
ENGINEERS • CONSTRUCTORS
300 west adams street • chicago, illinois 60606 • telephone 263-0556 area code 312

January 8, 1991

Mr. Gregory Jones
Operating Manager
CLEAN HARBORS, INC.
11800 S. Stony Island Avenue
Chicago, Illinois 60617

Subject: Inspection of Indoor Drum Storage Area
HST Project No. 1785

Dear Mr. Jones:

On December 17, 1990 I visually inspected drum storage areas located in Process Building #2: Staging Area, Organic Storage, Alkaline Storage and Acid Storage.

Drums are from plastic material, 50 or 55 gallons and are totally closed. No poisons, toxic or flammable materials are stored in this area.

Individual areas are separated by 6" high continuous structural angle bolted to the floor, sealed with silicone and by 6' high railing. All structural steel is painted with Rust-Oleum industrial grade paint. Each storage area slop toward a trench. There is an individual trench per each storage area. Floor expansion joints are sealed with polyurethane sealant and silicone. The Acid Storage Area has its concrete floor coated with vinyl-ester. The floor in the other three storage areas is concrete coated with 1/4" thick epoxy. Drums in Staging Area are 1 - high. The rest of the storage drums are 2 - high, using wooden or polyurethane pallets.

Containment capabilities of each area are as follows:

Staging Area	1,142 gal.
Organic Storage	1,350 gal.
Alkaline Storage	675 gal.
Acid Storage	1,675 gal.

For additional information, see Clean Harbors drawing CHCI No. 4209 sheet 1 of 2 and sheet 2 of 2.

For engineering evaluation of structural integrity of concrete floor slab, see enclosed calculations (sheet 41, and 22).

Floors in all areas were clean and did not show any signs of cracks, deep scratches or any other damage. There were no signs of any leaks from stored drums. Steel members did not show any signs of corrosion. Some wooden pallets did show signs of deterioration and they need to be replaced.

For additional information, refer to CHCI Dwg. No. 4209 sheet 1 of 2 and sheet 2 of 2.

Therefore, I hereby certify that after visual inspection, Drum Storage Area is in good condition and can be used as intended.

Very truly yours,

HOYER-SCHLESINGER-TURNER, INC.
Engineers - Constructors

Marie Vanagas

Marie Vanagas, P.E.
Illinois No. 62-40801
Project Engineer

CC: James R. Laubsted, CHI

MV/ar

HOYER-SCHLESINGER-TURNER, INC.

SHEET 41 OF 4
PROJECT NO. 175
DATE 1/21/9
BY JNS

PROJECT Clean Harbors Chicago IL

SUBJECT Exist. Drum Storage Building No 2

EXIST. FLOOR SLAB STRUCTURAL INTEGRITY CHECK

REF. TO DWG A-1 OF 3 BY SCHECK CONSTRUCT. CO.
EXIST FLOOR SLAB IS

6" CONC. SLAB W/6×6 – #6 WWF REINF
6" COMPACTED GRANULAR FILL, OR, USING NEW DESIGNATION

WWF 6×6 – W2.9×W2.9

FROM DWG No. 4209 (2916-S-02) BY CLEAN HARBORS
WE CAN FIND MAX. LOAD FROM STORAGE DRUMS

4.0' SQ. PALLET AREA SUPPORTS 8 DRUMS

8 DRUMS × (55 GAL × 1.5 SP GRAV × 8.36 LB/GAL + 50 LB SELFWT) = 5918 LB

SAY 6.0^K / 16 SF = 0.38 KSF

ASSUME CONSERVATIVELY THE WHOLE LOAD OF 6.0^K WILL BE APPLIED IN ONE SMALL AREA LIKE ONE CORNER OF A PALLET.

LIFT TRUCK LOAD IS CONSERVATIVE LOAD (25.0^K AXLE LOAD WITH SINGLE WHEEL AXLE)

SAY: EXIST. FLOOR SLAB 6" THK WITH WWF 6×6-W2.9×
IS STRUCTURALLY SOUND.

SAY OK

PROJECT CLEAN HARBOR CHICAGO IL

SUBJECT SLAB DESIGN FOR FORKLIFT LOAD

SHEET ___ OF ___
PROJECT NO. 17R5
DATE 1/10/91
BY JNS

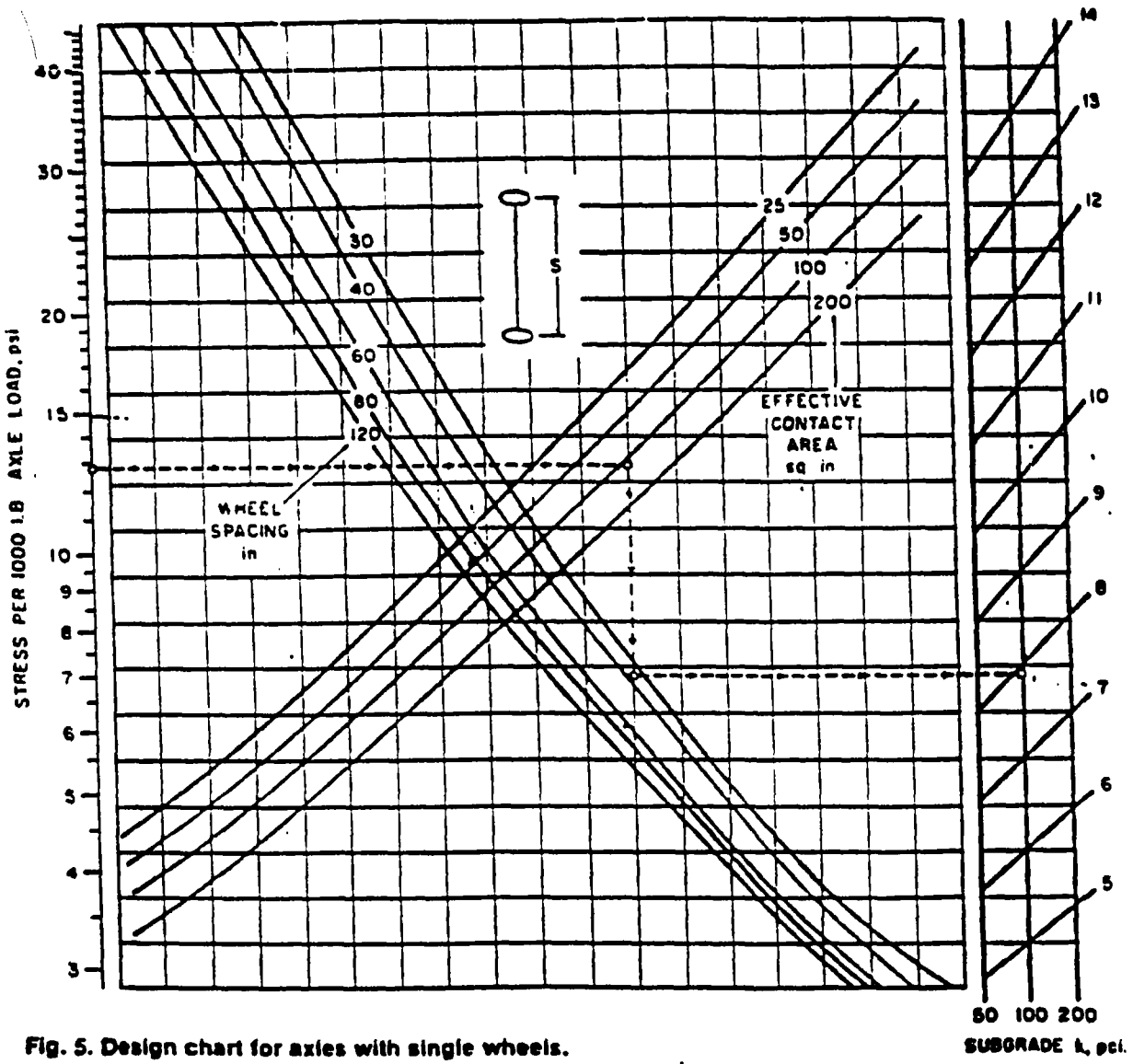


Fig. 5. Design chart for axles with single wheels.

APPENDIX D-8

PROFESSIONAL ENGINEER (PE) CERTIFICATION OF THE CONSTRUCTION OF THE PROPOSED/MODIFIED CONTAINER STORAGE AREAS

CleanHarbors
ENVIRONMENTAL SERVICES, INC.
1200 CROWN COLONY DRIVE, P.O. BOX 9137 • QUINCY, MA 02269-9137
(617) 849-1800

July 15, 1994

Permit Section, RCRA Unit
Division of Land Pollution Control
Illinois Environmental Protection Agency
P.O. Box 19276
Springfield, IL 62794-9276

RE: Clean Harbors of Chicago, Inc.
11800 S. Stony Island Avenue
Chicago, IL 60617
Revised Part B Permit Application

Dear Sir or Madam:

Please refer to: 0316000051 - Cook County
Clean Harbors of Chicago, Inc.
ILLD000608471
RCRA Permit Log No. 16
RCRA Permit File

I hereby certify that I, the undersigned am a Professional Engineer, licensed to practice in the State of Illinois.

I certify under penalty of law that the following proposed container management areas (existing structures):

- Building 25 container storage area
- Building 26 container storage area

were designed under my direct supervision and the design incorporates good engineering practices.

The structural design and itegrity of the foundations, floors and containment slabs will be reviewed prior to its usage and a supplemental certification will be provided.

Prior to coating, the concrete surfaces will be inspected for cracking and repaired if necessary. Prior to coating, any joints in the concrete floor will be inspected and properly repaired and sealed, if necessary.

CleanHarbors

All the containment areas will be coated with a one-quarter inch thick coating material that is chemically compatible with most of the stored waste materials. After careful consideration of all stored chemicals and discussion with coating manufacturer representative, Protecto-Crete 900 manufactured by Dudick, Inc. or equivalent was selected as most suitable. Technical specifications are listed in Appendix D-9 and 10.

Building 26, used for the ignitable container storage, will be modified as required to meet NFPA 30.

Respectfully submitted,

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.

Bhupendra Patel
Licensed Professional Engineer
Illinois No. 062-048690
My license expires on 11/30/94

CleanHarbors
ENVIRONMENTAL SERVICES, INC.
1200 CROWN COLONY DRIVE, P.O. BOX 9137 • QUINCY, MA 02269-9137
(617) 849-1800

July 13, 1994

Permit Section, RCRA Unit
Division of Land Pollution Control
Illinois Environmental Protection Agency
P.O. Box 19276
Springfield, IL 62794-9276

RE: Clean Harbors of Chicago, Inc.
11800 S. Stony Island Avenue
Chicago, IL 60617
Revised Part B Permit Application

Dear Sir or Madam:

Please refer to: 0316000051 - Cook County
Clean Harbors of Chicago, Inc.
ILLD000608471
RCRA Permit Log No. 16
RCRA Permit File

I hereby certify that I, the undersigned am a Professional Engineer, licensed to practice in the State of Illinois.

I certify under penalty of law that the following proposed areas:
- Container handling dock
- Truck staging areas for bulk ignitables
- Incoming truck staging area
- Truck-to-truck transfer dock

were designed under my direct supervision and the design incorporates good engineering practices.

The structural design of all areas listed above is suitable for intended use. Foundations, floors and containment slabs are designed for intendent load and will maintain structural integrity without failure. Water stops have been incorporated in the design, wherever necessary.

Coating/sealant systems which are compatible with the wastes will be stored will be provided in the containment areas. Prior to coating, the concrete surfaces will be inspected for cracking and repaired if necessary.

Respectfully submitted,

CLEAN HARBORS ENVIRONMENTAL SERVICES, INC.

Bhupendra Patel
Licensed Professional Engineer
Illinois No. 062-048690
My license expires on 11/30/94

Bhupendra Patel

HOYER-SCHLESINGER-TURNER inc.
ENGINEERS - CONSTRUCTORS
[illegible] West Adams Street Chicago, Illinois 60606 Telephone 263-0556 area code 312

July 21, 1994

Permit Section, RCRA Unit
Division of Land Pollution Control
Illinois Environmental Protection Agency
PO Box 19276
Springfield, Illinois 62794-9276

Re: Clean Harbors of Chicago, Inc.
11800 South Stony Island Avenue
Chicago, Illinois 60617
Revised Part-B Permit Application

Dear Sir or Madam:

Please refer to: 0316000051-Cook County
Clean Harbors of Chicago
ILD000608471
RCRA Permit Log No. 16

I hereby certify that I, the undersigned am a licensed Structural Engineer, licensed to practice in the State of Illinois.

I certify under penalty of law that the proposed Rail Car Unloading Area and Superstructure for Rail Car Unloading area were designed under my direct supervision and the design incorporates good engineering practice.

The structural design is suitable for intended use. Foundations and containment slabs are designed for intended load and will maintain structural integrity without failure.

Containment areas for Rail Car Unloading incorporates into design water stops between slab and walls.

After moist curing, floor and walls of all containment areas will be coated with a monolithic coating material that is chemically compatible with most of the waste materials. After careful consideration of all chemicals and discussion with coating manufacturer representatives, Protecto-Crete 900 manufactured by Dudick, Inc. was selected as most suitable. Technical specifications are listed in Appendix D-10.

Respectfully submitted,

HOYER-SCHLESINGER-TURNER, INC.

Peter J. Bernes

PETER J. BERNES
LICENSED STRUCTURAL ENGINEER
ILLINOIS NO. 3659
MY LICENSE EXPIRES ON 11-30-94

STATE OF ILLINOIS
PETER J.
BERNES
3659
LICENSED STRUCTURAL ENGINEER

TOTAL P.03

HOYER-SCHLESINGER-TURNER, INC.

SHEET 1 OF 3
PROJECT NO. 1785
DATE 7.14.94
BY BERNES

PROJECT CLEAN HARBORS OF CHICAGO
SUBJECT CAR UNLOADING AREA FOUNDATIONS

TOTAL LOAD PER 40' LENGTH

CAR WEIGHT = 72,000 # (EMPTY)

VOLUME = 30,000 GAL

MAX. SPECIFIC GRAVITY = 1.5

a) 72,000# + 30,000 × 8.35#/GAL = 322,500#

SUPERSTRUCTURE D.L. + L.L. (40#/S.F)

b) 30' × 40' × 40#/S.F = 48,000#

CONC. CONTAINMENT WALLS

c) 6.33' × 4.0' × 40' × 150# = 151,900#

TOTAL 522,400#

MAX. SOIL PRESSURE = 522,400#/40×18 + 190# = 916

$$M_{MAX} = \frac{(916 - 190) \times 5.5^2}{2} - 527^{\#} \times 4.33' = 8.70^{'k}$$

$$A_s = \frac{8.70^{'k}}{1.76 \times 12} = .41 \text{ IN}^2$$

USE #6 @ 12" C-C

BERNES
3659
LICENSED STRUCTURAL

LICENSED
MY LICENSE EXPIRES ON 11.30.94

PROJECT: CLEAN HARBORS OF CHICAGO, INC.

SUBJECT: CAR UNLOADING AREA SUPERSTRUCTURE

PURLIN

L.L. = 25 PSF
D.L. = 15 "
TOTAL = 40 PSF

PURLIN SPACING = 5.67'

LOAD ON PURLIN = 5.67 × 40 PSF = .23 KLF

$M = .23 \times 21.25^2/8 = 12.80^{'k}$

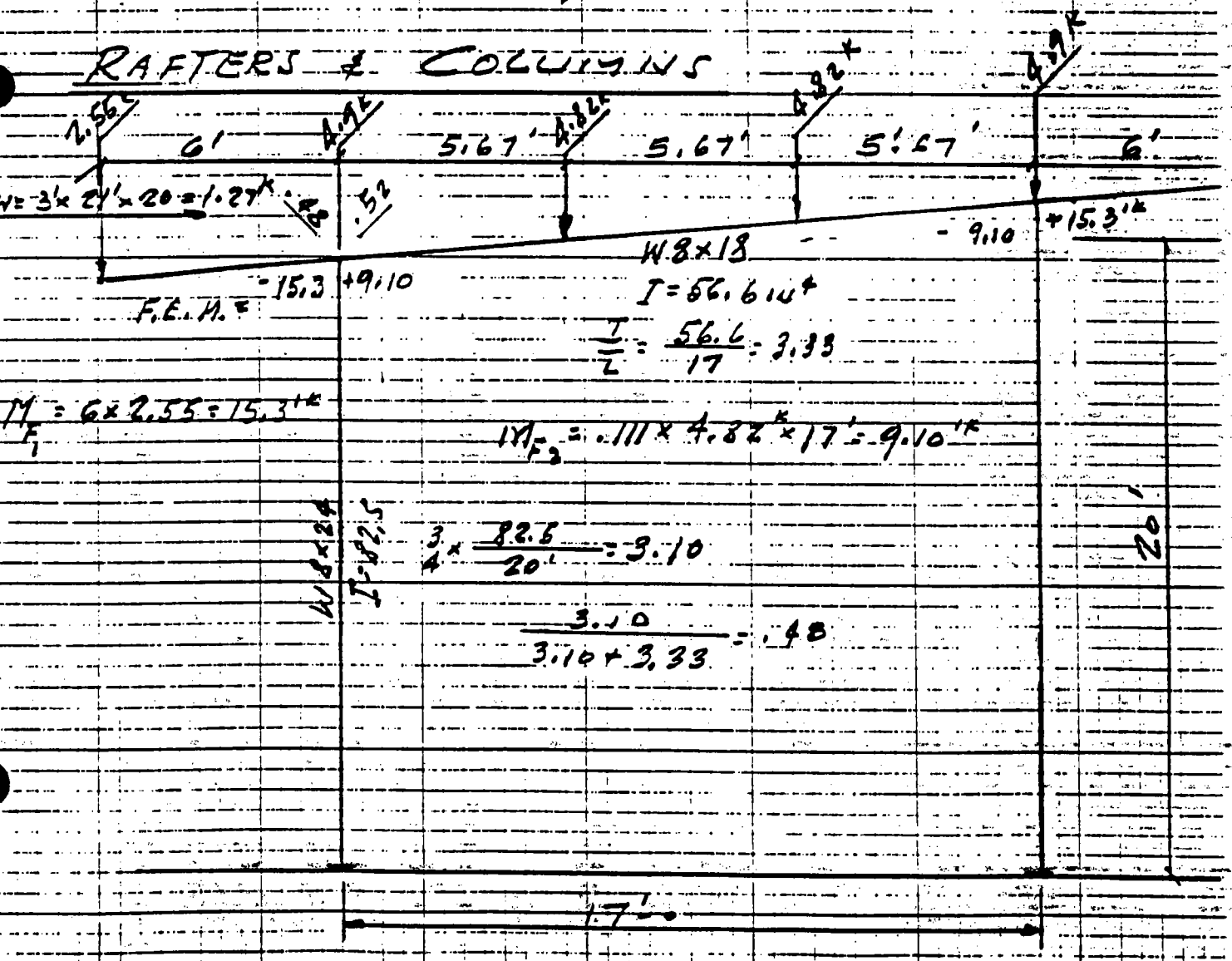
$S_{REQ'D} = 12.80 \times .5 = 6.4 \text{ IN}^3$

USE W 8×10 ($S = 7.81 \text{ IN}^3 > 6.4 \text{ IN}^3$) o.k.

$\Delta_{MAX} = \dfrac{5 \times 4.82^k \times (21.25 \times 12)^3}{384 \times 29{,}000 \times 30.8} = 1.17 \text{ IN}$

$\Delta_{ALL} = 21.25 \times 12/240 = 1.07 \text{ IN} \approx 1.17$ o.k.

RAFTERS & COLUMNS



HOYER-SCHLESINGER-TURNER, INC.

SHEET 3 OF 3
PROJECT NO. 1785
DATE 7.15.94
BY BERNE

PROJECT CLEAN HARBORS OF CHICAGO, INC
SUBJECT CAR UNLOADING AREA SUPERSTRUCTURE

MOMENT DISTRIBUTION

RAFTER

$M = 1.27^k \times 20'/2 = 12.7^{'k}$

.48 .52

CANT. -15.3	+9.10		-12.7	
	+3.22		+6.1	+6.6
	+12.3'k BM		-6.6	+6.6'k
+3.0 COL.			COL.	BM

D.L. + L.L. WIND

RAFTER MOMENT D.L. + L.L. + WIND = 18.9'

$S_{REQ'D} = 18.9^{'k} \times .75 \times .5 = 7.09\ IN^3$

W 8x18 ($S = 14.1\ IN^3 > 7.09\ IN^3$ O.K.)

CANTILEVER MOMENT = $2.55^k \times 6 = 15.3^{'k}$

$S_{REQ'D} = 15.3^{'k} \times .5 = 7.65\ IN^3 < 14.1\ IN^3$ O.K

COLUMN
W 8x24
$A = 7.06\ IN^2$
$S = 20.8\ IN^3$

VERTICAL LOAD = $4.82^k + 4.9^k + 2.55^k = 12.27$

COL. MOMENT = $9.6^{'k}$

$\frac{KL}{R} = \frac{2 \times 20' \times 12}{3.42} = 140 \quad F_a = 7.62\ KSI$

$f_a = \frac{12.27^k}{7.06} = 1.74\ KSI \quad f_b = \frac{9.6^{'k} \times 12}{20.8} = 5.54\ KSI$

$f_a/F_a + f_b/F_b = \frac{1.74}{7.62} + \frac{5.54}{22} = .23 + .25 = .48 < 1.3$

that the soils encountered were relatively impermeable. The limited time available to occupy the site did not permit water level readings to be obtained at later intervals.

It should be noted that groundwater levels on this site may vary due to seasonal conditions and recent rainfall, drought or temperature effects.

FOUNDATION DISCUSSION AND RECOMMENDATIONS

Project Description

Based upon the information provided, it is understood that the proposed project consists of a pre-engineered steel storage building utilized to store drums for Clean Harbors. Reportedly loads are anticipated to be relatively light.

This information was provided by Custom Steel Buildings, Inc.

Foundation Discussion

Various foundation types have been considered for the support of the proposed structure. The foundation types considered included conventional spread and continuous wall footings, available types of piles, drilled piers or caissons.

Conventional Spread and Continuous Wall Footings - Conventional spread and continuous wall footings are generally most economical when the existing soils conditions allow them to be founded at shallow depths.

However, because of the relatively low net allowable bearing capacity of these foundation soils and the relatively large

JUN-11-1991 09:03 FROM HOYER SCHLESINGER TURNER TO 16177869716 P.13
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V BY:CleanHarbors/Crown 6F1: 6-11-91 :10:04AM : 2630820→ 6177869716:#14

Precautions should be taken to permit the caissons to be drilled, reamed and concreted under relatively dry conditions. Considering the presence of miscellaneous fills in the upper ten (10) feet, it may be necessary to utilize bentonite or steel casing to support the walls of the shaft during drilling and concreting. This will also minimize or prevent the inflow of water during the belling and cleaning operations.

Extreme care must be exercised during concreting and removal of a temporary liner, if used, so that the possibility of soil intrusions is avoided. The contractor should submit his procedures for caisson installation prior to the start of work.

Caisson shafts should be clean and free of all loose material prior to placement of concrete. A representative of the geotechnical engineer should verify that caissons are placed on competent bearing materials and that the installation procedures meet specifications.

If contract prices for the installation of caissons are based upon unit quantities, and where it is necessary to adjust caisson depths or bell diameters to suit the particular soil conditions, the inspection procedures should include a record of the caisson dimensions in order to verify pay quantities.

Floor Slab-On-Grade

Care must be taken so that all excavations made for the foundations are properly backfilled with suitable material

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compacted in accordance with the procedures outlined hereafter in the specifications. Before the backfill is placed, all water and loose debris should be removed from these excavations.

Prior to the placing of concrete floors or pavements on this site, or before any floor supporting fill is placed, the organic, loose or obviously compressive materials must be removed. The subgrade should then be proof-rolled until the grade offers a relatively unyielding surface or until the specified degree of compaction has been achieved. Areas of excessive yielding should be excavated and backfilled with clean, compacted soil.

Any additional fill used to increase the elevation of the floor slab should be placed in layers of not more than nine (9) inches in thickness, at moisture contents at or above optimum, and compacted to a minimum density of 95 percent of the maximum dry density as determined by ASTM designation D-1557. The fill material should preferably be a well graded granular, non-expansive material. However, existing on-site materials may also be used, subject to approval by the geotechnical engineer.

A granular mat should be provided below the floor slabs. This should be a minimum of four (4) inches in thickness and properly compacted. An impervious membrane should be provided as a vapor barrier beneath the slab.

The floor slab should be suitably reinforced and proper joints should be provided at the junctions of the slab and foundation

system so that a small amount of independent movement can occur without causing damage. It is suggested that a six (6) inch thick slab with a road-mesh type reinforcement be used.

Inasmuch as the floor slab may be supporting live loads in the form of moving fork lift trucks, it is recommended that all construction joints in the floor slab be provided with a key or dowels to permit the proper transfer of loads. Large floor areas should be provided with joints at frequent intervals to compensate for concrete volume changes.

Summary

Caissons or drilled piers along with slab-on-grade floor construction are recommended for use as foundations for the proposed structure. Design parameters have been presented in this report. The final choice of foundation type should be based on the relative economic, engineering and construction advantages, considered in light of the planning and design of the proposed structure.

CONSTRUCTION CONSIDERATIONS

Site Preparation

Excessively organic soils, loose fill materials and soft soils generally undergo high volume changes when subjected to loads. This is detrimental to the behavior of pavements, floor slabs, structural fills and shallow foundations placed upon them. Therefore, it is recommended that these deleterious materials be stripped from these areas where encountered and wasted or stockpiled for later use. Based on the information obtained

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stockpiled for later use. Based on the information obtained from the borings, it appears that these materials will need to be removed to depths of approximately two and one-half (2.5) to three (3) feet. Exact depths of stripping, however, should be determined by a representative of the geotechnical engineer in the field at the time stripping is carried out.

After the existing subgrade soils are excavated to design grade, proper control of subgrade compaction and the placement and compaction of new fill should be maintained by a representative of the geotechnical engineer. The specifications for compacted fills and backfills, presented in the Appendix of this report, can be utilized to minimize the volume changes and differential settlements which are detrimental to the behavior of footings, pavements and floor slabs.

The fill materials should be free of organic matter and be compacted to a minimum of 95 percent of the maximum dry density as determined by ASTM designation D-1557 in structural areas. A sufficient number of density tests should be taken to monitor proper compaction.

Precautions should be exercised during the removal of existing structures at the site. Any existing buried structures, tree stumps, wells, utilities, etc. should be removed, the excavations cleaned of all foreign debris and then backfilled with a suitable compacted fill material to lessen or eliminate any possible settlement that may occur beneath the building or parking area.

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Groundwater Control

The borings reveal a relatively low groundwater level, and little difficulty during excavation and construction is anticipated.

Since the foundation materials generally tend to soften when exposed to free water, every effort should be made to keep the excavations dry if water is encountered. A gravity drainage system, sump pump, or other conventional minor dewatering procedure should be sufficient for this purpose.

Excavations extending below the water table and into the deposits of fine sand and silt may cause the soils to become "quick-acting" when the confining effect of the surcharge is removed. If the excavations are to extend only a foot or so into this stratum, it is expected that the water can be controlled by permitting it to drain into temporary construction sumps located outside the perimeter of the building excavations. If deeper excavations are contemplated, it may be necessary to provide a well point system to lower the groundwater table and to facilitate the completion of the excavation.

Excavations

Where the excavations exceed four (4) feet in depth, it may be necessary to provide lateral support for the slopes of the excavations. Several systems of bracing may be used. Each has its advantages and disadvantages, and the selection of a bracing

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system should be based on the relative merits of each. It is to be noted that provisions for shoring and bracing of deep excavations are required by OSHA and other building codes.

Materials removed from the excavation should not be stockpiled immediately adjacent to the excavation, inasmuch as this load may cause a sudden collapse of the embankment. Prior to the placing of concrete for the footings, the excavations should be inspected to make sure that all traces of loose material have been removed, particularly where continuous footings are excavated with a trench machine. Where reinforcing steel is placed in the foundations, an inspection must be maintained to determine that proper chairs or supports are provided and that the reinforcing is properly positioned.

GENERAL COMMENTS

When the plans and specifications are more complete, or if significant changes are made in the character or location of the proposed structure, a consultation should be arranged to review them with respect to the prevailing soil conditions. At that time, it may be necessary to submit supplementary recommendations.

JUN-11-1991 09:09 FROM HOYER SCHLESINGER TURNER TO 869716 2630820- 6177869716:# 5 P.05

It is recommended that the services of a qualified geotechnical engineer be engaged to test and evaluate the soils in the footing excavations prior to concreting in order to determine that the soils have the required bearing capacities. Monitoring and testing should also be performed to verify that suitable materials are used for controlled fills and that they are properly placed and compacted.

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APPENDIX

SOIL ENGINEERS SUBSURFACE INVESTIGATIONS

LOUIS K. WALTER, JR. & ASSOCIATES, INC.

215 INDUSTRIAL LANE • WHEELING, ILLINOIS 60090 • TEL. (312) 541-1010

September 19, 1980

R. A. Morley Company, Inc.
3223 Arnold Lane
Northbrook, Illinois 60062

LKW - #5637

Attention: Mr. Bruce Klefstad

Gentlemen:

Two (2) soil borings have been completed at the site of the proposed Industrial Building to be constructed for Chem Clear on the parcel located on the west side of Stony Island Avenue south of East 117th Street (adjacent to Slip 4) in Chicago, Illinois. The results and location of the borings are indicated on the enclosed drawings.

The purpose of the subsurface investigation was to determine the physical properties of the soil present on the site, analyze the results and submit recommendations regarding design and construction of foundations for the proposed one story, slab-on-grade, industrial building. It is anticipated the wall, column and floor loads of the proposed structure will be light to moderate in magnitude.

Elevation of ground surface at the boring location is referred to the level of the top of the nail on the east face of the nearby utility pole as +9.82.

The general soil conditions at the site, as indicated by the results of the borings, consist of a surface layer of fill extending to the bottom of the boring, 15' below existing grade.

On the basis of the results of the borings, we recommend supporting the proposed building on a conventional footing foundation with the following qualification. Although the existing fill appears to be relatively well compacted (penetration value, 'N' greater than 15 at foundation level), we recommend over-digging a minimum of two feet below normal design level at the location of the isolated interior columns and perimeter foundation walls and replacing the excavated material with properly compacted coarse granular (3" diameter) fill (utilizing a net allowable soil bearing pressure not to exceed 3,000 psf to proportion the base of the footings. We recommend removing two feet of the existing

material primarily because of the composition of the fill. The foundry sand, slag and chemical waste may be deleterious to the concrete and cause future distress to the foundation. We do not anticipate any significant settlement of the building supported in this manner.

During the performance of the test borings, water was not encountered within the depth of the anticipated excavations. Therefore, the excavating operations should be conducted in the 'dry.'

Prior to the installation of the granular base course fill necessary to achieve the desired final grade for support of the proposed floor slab on grade, parking and driveway areas, we recommend proof-rolling the area with a heavily loaded truck. If loose or soft areas are observed, we recommend removing them and replacing the excavated material with approved fill compacted to a minimum 90% of ASTM Specification D 1557-70 (Modified Proctor) density.

We have welcomed the opportunity to be of service to you on this project. If there are any questions with regard to the information and/or recommendations presented, please do not hesitate to contact us.

Yours very truly,

LOUIS K. WALTER, JR. & ASSOCIATES, INC.

Louis K. Walter, Jr.

Louis K. Walter, Jr.
President

LKW:bb

Enclosures

SOIL ENGINEERS SUBSURFACE INVESTIGATIONS

LOUIS K. WALTER, JR. & ASSOCIATES, INC.

PROJECT: PROPOSED INDUSTRIAL BUILDING, CHEM CLEAR, STONY ISLAND AVENUE, CHICAGO, ILLIN

LOG OF BORING

BORING NO. 1 (9/16/80)

D	SOIL TYPE	S	'N'	Q_u	W_c
	Ground Surface Elevation: +15.70				
0	0				
3	FILL (brown & grey sandy silt Chemical waste)	1	4		
		2	11		
6		3	15		
		4	13		
9	▽ ▼				
	10.6'				
12	FILL (slag, some wood)				
15	15'				
18	End of boring				

NOTES

1. E : ELEVATION - Feet
2. D : DEPTH - Feet
3. S : SAMPLE NO.
4. 'N': PENETRATION - Blows/
5. Q_u: UNCONFINED STRENGTH Tons/Square Foot
6. W_c: WATER CONTENT - %
7. WATER LEVEL READINGS
   a. ▼ : While Sampling
   b. ▽ : After Boring
8. Q_p: PENETROMETER TEST (o

SOIL ENGINEERS

SUBSURFACE INVESTIGATIONS

LOUIS K. WALTER, JR. & ASSOCIATES, INC.

215 INDUSTRIAL LANE • WHEELING, ILLINOIS 60090 • TEL. (312) 541-1010

PROJECT: PROPOSED INDUSTRIAL BUILDING, CHEM CLEAR, STONY ISLAND AVENUE, CHICAGO, IL.

LOGS OF BORINGS

BORING NO. 2 (9/16/80)							BORING NO.						
D	SOIL TYPE	S	'N'	Q_u	W_c		D	SOIL TYPE	S	'N'	Q_u	W	
	Ground Surface Elevation: +15.82												
0	0												
3	FILL (brown & black foundry sand - some fine slag)	1	18										
6		2	29										
		3	34										
9													
	▽												
12		4	41										
15	15'	5	60/6"										
	End of boring												
18													

SOIL ENGINEERS SUBSURFACE INVESTIGATIONS

LOUIS K. WALTER, JR. & ASSOCIATES, INC.

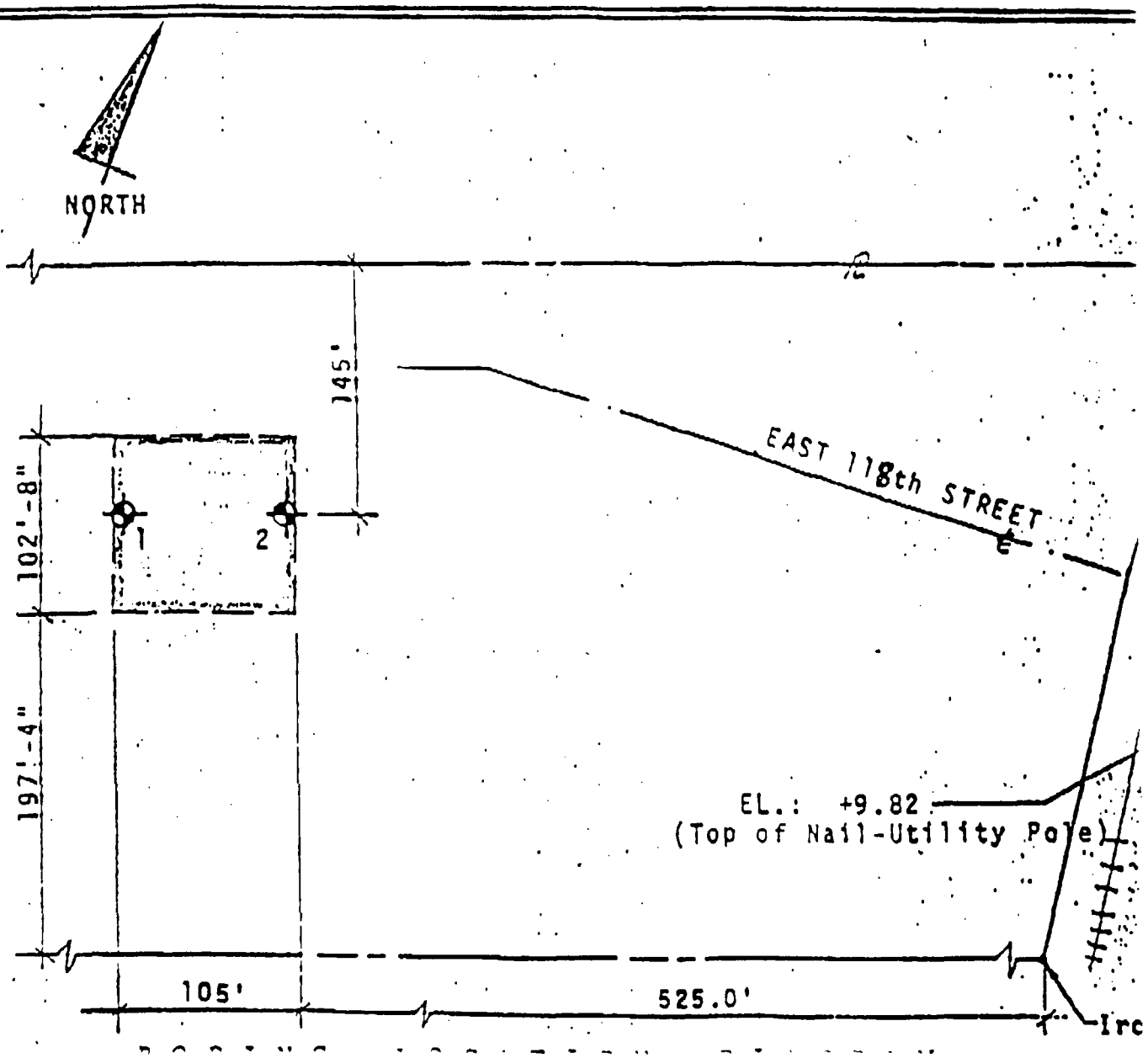
215 INDUSTRIAL LANE • WHEELING, ILLINOIS 60090 • TEL. (312) 541-1010

PROJECT: PROPOSED INDUSTRIAL BUILDING

CHEM CLEAR

STONY ISLAND AVENUE, South of EAST 117th STREET

CHICAGO, ILLINOIS



Professional Service Industries, Inc.
PTL / A & H Flood Division

RECEIVED AUG 3 0 1990

August 28, 1990

Custom Steel Buildings, Inc.
17070 South Park Avenue
South Holland, Illinois 60477

Attention: Mr. Larry Lyman

Re: Subsurface Exploration
Proposed Storage Building
Clean Harbors
Chicago, Illinois
PSI File No.: 152-05039
Addendum to Report No. 1

Gentlemen:

In compliance with your instructions, we have conducted an additional foundation evaluation for the above referenced project. Supplementary recommendations are included in this letter, three (3) copies of which are being transmitted herewith.

As an alternate to the use of drilled piers or caissons, it may be economically feasible to remove the deposits of fill to a depth of approximately six (6) feet below grade. The excavation can then be backfilled with a select, clean, granular soil, such as IDOT Specification CA-6, placed in layers of not more than nine (9) inches in thickness, with each layer being compacted to a minimum density of 95 percent of the maximum dry density as within ±3% of optimum moisture content determined by ASTM designation D-1557 values. The area of the compacted backfill must extend outside the perimeter of the foundation for a distance at least equal to the thickness of the fill between the bottom of the foundation and the underlying undisturbed soils. If this procedure is followed, it is expected that the fill will be capable of supporting loads of up to 1,500 P.S.F. All continuous footings placed upon the compacted backfill

4421 Harrison Street • Hillside, IL 60162 • Phone: 312/449-0500

UN-11-1991 08:58 FROM HOYER SCHLESINGER TURNER TO 16177869716 P.02

If it is elected to utilize a compacted backfill for the support of foundations, the excavations and the placing of the backfill should be monitored continuously by a qualified geotechnical engineer so that the work is performed in accordance with these specifications. It should be noted that this alternative does not eliminate the potential for future settlement and this should be taken into consideration when designing the structure.

If you have any additional questions concerning these alternative recommendations, please call.

Very truly yours,

PROFESSIONAL SERVICE INDUSTRIES, INC.

Gregory C. Butcher
Division Manager

Jack T. Roseman

Jack T. Roseman, P.E.
Senior Geotechnical Engineer

GCB/JTR:sjp

Professional Service Industries, Inc.
PTL/A & H Flood Division

June 21, 1990

RECEIVED JUN 2 9 1990

Custom Steel Buildings, Inc.
17070 South Park Avenue
South Holland, Illinois 60477

Attention: Mr. Bill Vander Woode
Project Manager

Re: Subsurface Exploration
Proposed Storage Building
Clean Harbors
Chicago, Illinois
PSI File No.: 152-05039

Gentlemen:

In compliance with your instructions, we have conducted a soils exploration and foundation evaluation for the above referenced project.

The results of this investigation, together with our recommendations, are to be found in the accompanying report, three (3) copies of which are being transmitted herewith.

Often, because of design and construction details which occur on a project, questions arise concerning soil conditions, and we would be pleased to continue our role as geotechnical engineers during the project implementation.

We also have great interest in providing materials testing and inspection services during the construction of this project. If you will advise us of the appropriate time to discuss these engineering services, we will be pleased to meet with you at your convenience.

Very truly yours,

PROFESSIONAL SERVICE INDUSTRIES, INC.

Gregory C. Butcher
Division Manager

Jack T. Roseman

Jack T. Roseman, P.E.
Senior Geotechnical Engineer

GCB/JTR:sjp

4421 Harrison Street • Hillside, IL 60162 • Phone: 708/449-0500 • FAX: 708/449-0507

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SOILS EXPLORATION AND FOUNDATION RECOMMENDATIONS FOR THE PROPOSED STORAGE BUILDING CLEAN HARBORS CHICAGO, ILLINOIS

PREPARED FOR

CUSTOM STEEL BUILDINGS, INC.
17070 SOUTH PARK AVENUE
SOUTH HOLLAND, ILLINOIS 60477

BY

PROFESSIONAL SERVICE INDUSTRIES, INC.

JUN-11-1991 08:59 FROM HOYER SCHLESINGER TURNER TO 16177869716 P.04
V BY:CleanHarbors/Crown 6F11 6-11-91 11:00AM 2630820- 6177869716

SUBSURFACE EXPLORATION

AND

FOUNDATION RECOMMENDATIONS

INTRODUCTION

This report presents the results of a soils exploration and foundation analysis for the proposed storage building, conducted for Custom Steel Buildings, Inc.

Authorization

Authorization to perform this exploration and analysis was in the form of a signed acceptance of PSI Proposal 152-059, dated June 12, 1990.

Purpose

The purpose of this foundation exploration and analysis was to determine the various soil profile components, the engineering characteristics of the foundation materials and to provide criteria for use by the design engineers and architects in preparing the foundation design.

Scope

The scope of the exploration and analysis included a reconnaissance of the immediate site, the subsurface exploration, field and laboratory testing, and an engineering analysis and evaluation of the foundation materials.

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The scope of services did not include any environmental assessment for the presence or absence of wetlands or hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site. Any statements in this report or on the boring logs regarding odors, colors or unusual or suspicious items or conditions are strictly for the information of the client. Prior to purchase or development of this site, an environmental assessment is recommended.

It should be noted that odor and discolored soils were observed during the boring operations. Consideration should be given to providing the necessary safety provisions for construction personnel when construction activities commence.

General

The exploration and analysis of the foundation conditions reported herein are considered sufficient in detail and scope to form a reasonable basis for the foundation design. The recommendations submitted for the proposed storage building are based on the available soil information, and preliminary design details furnished by Mr. Bill Vander Woode, representing Custom Steel Buildings, Inc. Any revision in the plans for the proposed structure from those enumerated in this report should be brought to the attention of the geotechnical engineer so that he may determine if changes in the foundation recommendations are required. If deviations from the noted subsurface conditions are encountered during construction, they should also be brought to the attention of the geotechnical engineer.

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The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein, have been promulgated after being prepared in accordance with generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics and engineering geology. No other warranties are implied or expressed.

After the plans and specifications are more complete, it is recommended that the geotechnical engineer be provided the opportunity to review the final design and specifications, in order that the earthwork and foundation recommendations may be properly interpreted and implemented. At that time, it may be necessary to submit supplementary recommendations.

DESCRIPTION OF SITE

Site Location

The site of the proposed storage building upon which this soils exploration has been made, lies within the existing Clean Harbors facility, located at 11800 Stony Island Avenue in Chicago, Illinois.

Site Topography, Drainage and Vegetation

This site is relatively flat, there being no noticeable difference in elevation between the north and south ends of the property. The site was firm and the drilling equipment experienced little difficulty in moving around the site.

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FIELD EXPLORATION

Scope

The field exploration to determine the engineering characteristics of the foundation materials included a reconnaissance of the project site, making the borings, performing standard penetration tests, and recovering split-barrel samples. The apparent groundwater level was recorded in each boring while drilling and after completion.

Five (5) soil test borings have been made, and these were drilled to depths ranging from thirteen and one-half (13.5) to fifteen (15) feet below the existing ground surface. They were drilled in the locations indicated on the boring location plan provided in the Appendix. The borings were located by the driller by means of normal taping procedures and are presumed to be accurate to within a few feet. After completion of the borings, the drill holes were backfilled with excavated soil.

Drilling and Sampling Procedures

The soil borings were performed with a drilling rig equipped with a rotary head. Conventional hollow-stem augers were used to advance the holes. Representative samples were obtained employing split-barrel sampling procedures in accordance with ASTM designation D-1586. Samples were identified according to boring number and depth and transported to the laboratory in special containers.

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Field Tests and Measurements

Penetration Tests - During the sampling procedure, standard penetration tests were performed at regular intervals to obtain the standard penetration value of the soil. The standard penetration value (N) is defined as the number of blows of a 140 pound hammer, falling thirty (30) inches, required to advance the split-barrel sampler one (1) foot into the soil. The sampler is lowered to the bottom of the drill hole and the number of blows recorded for each of three (3) successive increments of six (6) inches penetration. The "N" value is obtained by adding the second and third incremental numbers. The results of the standard penetration test indicate the relative density and comparative consistency of the soils, and thereby provide a basis for estimating the relative strength and compressibility of the soil profile components.

Water Level Measurements - Water level observations were made during the boring operations and are noted on the boring logs presented herewith. In relatively pervious soils, such as sandy soils, the indicated elevations are considered reliable groundwater levels. In relatively impervious soils, the accurate determination of the groundwater elevation may not be possible even after several days of observation. Seasonal variations, temperature and recent rainfall conditions may influence the levels of the groundwater table and volumes of water will depend on the permeability of the soils.

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BY:CleanHarbors/Crown 6F1: 6-11-91 ;10:02AM ; 2630820→ 6177869716;# 9

Ground Surface Elevations - The elevation of the ground surface at each boring location was not determined. It is recommended that these elevations be established prior to the start of construction.

LABORATORY TESTING PROGRAM

In addition to the field investigation, a supplemental laboratory testing program was conducted to determine additional pertinent engineering characteristics of the foundation materials necessary in analyzing the behavior of the proposed structure.

All phases of the laboratory testing program were conducted in general accordance with applicable ASTM Specifications and the results of these tests are to be found on the accompanying boring logs located in the Appendix.

The laboratory testing program included supplementary visual classification and water content determination on all samples. The shear strengths of the various cohesive soils were determined from unconfined compressive strength tests on samples obtained from split-barrel samplers. Estimates of unconfined compressive strengths were made by the use of a calibrated penetrometer.

SUBSURFACE CONDITIONS

General

The types of foundation materials encountered have been visually classified and are described in detail on the boring

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logs. The results of the field penetration tests, strength tests, water level observations and other laboratory tests are presented on the boring logs in numerical form. Representative samples of the soils were placed in sample jars and are now stored in the laboratory for further analysis if desired. Unless notified to the contrary, all samples will be disposed of after two months.

The stratification of the soils, as shown on the boring logs, represents the soil conditions in the actual boring locations, and other variations may occur between the borings. Lines of demarcation represent the approximate boundary between the soil types, but the transition may be gradual.

It is to be noted that, whereas the test borings are drilled and sampled by experienced drillers, it is sometimes difficult to record changes in stratification within narrow limits. In the absence of foreign substances, it is also difficult to distinguish between discolored soils and clean soil fill.

Description of Foundation Materials

An idealized soil profile to be found upon this site consists of an upper layer of brown silt or brown silty clay fill overlying sand and silt fill or possible fill. The brown silt or silty clay fill extends to depths varying from two and one-half (2.5) to three (3) feet below existing grade. Natural moisture contents of the brown silt or silty clay fill range from approximately 28.8 to 65.0 percent.

UN-11-1991 09:02 FROM HOYER SCHLESINGER TURNER TO 16177869716 P.11
BY:CleanHarbors/Crown 6F1; 6-11-91 ;10:03AM ; 2630820→ 6177869716;#11

Possible fill or fill consisting of silts and sands were encountered below the brown silt or silty clay fill. The possible fill or fill extends to depths ranging from seven and one-half (7.5) to ten (10) feet below existing grade, and are characterized as medium dense to very dense with "N" values varying from approximately eight (8) to 62/8" bpf. Natural moisture contents of these soils range from approximately 28.9 to 90.8 percent.

Silts, sands, and peats were encountered below the possible fill or fill soils and extend to the boring termination depths. These soils are characterized as medium dense to very dense with "N" values ranging from six (6) to 100/0" bpf. Natural moisture contents of these soils vary from approximately 16.0 to 82.1 percent.

It should be noted that the soils encountered throughout the site exhibited odor and discoloration. In addition, natural moisture contents of the soils are very high. A detailed description of the soils will be found on the soil boring logs in the Appendix.

Groundwater Observations.

Groundwater was encountered in Borings B-1, B-2, B-3 and B-4 at depths ranging from seven (7) to thirteen (13) feet below existing grade.

Boring B-5 was dry upon completion, indicating that the groundwater level at the time of the exploration was either more than fifteen (15) feet below the existing ground surface, or

JUN-11-1991 09:03 FROM HOYER SCHLESINGER TURNER TO 15177869716 P.12
BY:CleanHarbors/Crown 6F1: 6-11-91 :10:03AM : 2630820→ 6177869716:#12

CleanHarbors
ENVIRONMENTAL SERVICES COMPANIES
1200 CROWN COLONY DRIVE
P.O. BOX 9137
QUINCY, MA 02269
(617) 849-1800

Certified Mail - Return Receipt Requested P 405 836 496

May 28, 1992

Mr. Mark Schollenberger, P.E.
Illinois Environmental Protection Agency
Division of Land Pollution Control -- #24
Permit Section
2200 Churchill Road
Post Office Box 19276
Springfield, IL 62794-9276

Re: Clean Harbors of Chicago, Inc.
Response to Deficiencies - RCRA Part B License Application

Dear Mr. Schollenberger:

In response to Comment B-1 of IEPA's notice dated November 4, 1991, Clean Harbors of Chicago, Inc. (CHCI) has prepared and is please to submit the enclosed treatability study data for certain hazardous waste codes that have been proposed for stabilization/fixation at CHCI. Following stabilization/fixation, these treated wastes will be shipped for disposal at an offsite hazardous waste landfill.

Please note that to date, CHCI has completed treatability studies on EPA waste codes D002, D006-8, F006, F019, and K062. Treatability data for the remaining stabilization/fixation codes listed in Table C-8 of the Part B Application will be submitted upon completion.

Please feel free to contact me at (617) 849-1800, extension 4473, if you have any questions.

Sincerely,

Paul A. Ahearn

Paul A. Ahearn
Compliance Project Manager

cc: Stephen Pozner - CHI
Joseph McNally - CHCI

Attachment

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS _____
OK ___ ACCEPT ___ REJECT ___
PRICE _____
QUOTE _____

CODES D002

WASTE SOURCE INLAND
WASTE GENERATOR
WASTE DESCRIPTION H_2SO_4 SLUDGE
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE	YELLOW SLURRY	WATER MISCIBILITY	+
% FLOATER	—	% OIL ON ACIDIFICATION	—
% FREE OIL	—		

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
PH	0.7		Ag, ppm	<0.1	
% TOTAL SOLIDS	57.4		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	<0.1	
% SUSPENDED SOLIDS	15.2		Cd, ppm	0.2	
% SETTLEABLE SOLIDS			Cr, ppm	1.5	
FLASH POINT °C	>200		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	<10		Cu, ppm	28	
PHENOLS, ppm	—		Hg, ppb	<0.1	
CHLORIDE, ppm			Ni, ppm	7.4	
BROMIDE, ppm			Pb, ppm	0.9	
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	—		Zn, ppm	454	
BOD, ppm			Fe, ppm	2400	
ACIDITY mg/l as $CaCo_3$			PCB, ppm	—	
ALKALINITY mg/l as $CaCo_3$			Tl ppm	<0.1	
CYANIDE ppm (TOTAL)	<10		NH	—	
CYANIDE ppm (RELEASE)					
SULFIDE ppm (TOTAL)	<10		TOX ppm		
SULFIDE ppm			TOC ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10)
~~TREATMENT WITH MIX TANK~~ STABILIZATION (100 ml WASTE + ~~ml MIX TANK~~) 50 gm LIME

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume			IRON, ppm		
% SOLIDS Produced by Weight			NICKEL, ppm		
COD, ppm			ZINC, ppm		
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm		
BORON ppm			LEAD, ppm		
CADMIUM ppm			MERCURY, ppb		
CHROMIUM (TOTAL), ppm			Tl ppm		
CHROMIUM (HEX) ppm					

ACCEPTED: REJECTED:

COMMENTS FINAL pH (10%) 10.2

California List
Yes ____ No ____
Please Check

Sent for G.C.

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS _____
OK ___ ACCEPT ___ REJECT ___
PRICE _____
QUOTE _____

DATE _____
TIME _____
TERMS _____
DATE CODES Dec. 1007, 2008

WASTE SOURCE MORTON
WASTE GENERATOR
WASTE DESCRIPTION PAINT PIGMENT
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE	Brown, Paint Pigment	WATER MISCIBILITY	+
% FLOATER	—	% OIL ON ACIDIFICATION	—
% FREE OIL	—		

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
PH	—		Ag, ppm	4.6	
% TOTAL SOLIDS	24.8		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	28	
% SUSPENDED SOLIDS	100		Cd, ppm	1.0	1.0
% SETTLEABLE SOLIDS			Cr, ppm	164	161
FLASH POINT °C	>200		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	648		Cu, ppm	100,000	
PHENOLS, ppm	<2		Hg, ppb	<0.1	
CHLORIDE, ppm			Ni, ppm	460	
BROMIDE, ppm			Pb, ppm	716	702
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD ppm	—		Zn, ppm	6.0	
BOD ppm			Fe, ppm	76	
ACIDITY mg/l as $CaCo_3$			PCB, ppm	—	
ALKALINITY mg/l as $CaCo_3$			Tl, ppm	<0.1	
CYANIDE ppm (TOTAL)	<10		NH	—	
CYANIDE ppm (RELEASE)					
SULFIDE ppm (TOTAL)	<10		TOX ppm		
SULFIDE ppm			TOC ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10)
~~TREATMENT WITH MIX TANK~~ STABILIZATION 100 gm ~~ml~~ WASTE + ~~ml MIX TANK~~ 50 gm LIME + 2 gm F

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume			IRON, ppm		
% SOLIDS Produced by Weight			NICKEL, ppm		
COD, ppm			ZINC, ppm		
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm		
BORON, ppm			LEAD, ppm		3.4
CADMIUM ppm		<0.1	MERCURY, ppb		
CHROMIUM (TOTAL), ppm		3.79	Tl ppm		
CHROMIUM (HEX), ppm			PAINT FILTER		PASS

ACCEPTED: REJECTED:

COMMENTS FINAL pH (107) 11.4

California List
Yes _____ No _____
Please Check

Sent for G.C

Clean Harbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS _____
OK ___ ACCEPT ___ REJECT
PRICE _____
QUOTE _____

PERMIT # _____
HAZ CODES F019

WASTE SOURCE: ALUMINUM CORP
WASTE GENERATOR:
WASTE DESCRIPTION: CHEMICAL CONVERSION COATING OF ALUMINUM TREATMENT SLUDGE
RECEIPT DATE: VOLUME:

WASTE CHARACTERISTICS

COLOR/APPEARANCE	GRAY SOLID	WATER MISCIBILITY	+
% FLOATER	—	% OIL ON ACIDIFICATION	—
% FREE OIL	—		

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
pH	—		Ag, ppm	0.8	
% TOTAL SOLIDS	28.6		As, ppm	0.2	
% DISSOLVED SOLIDS			Ba, ppm	12	
% SUSPENDED SOLIDS	[illegible]		Cd, ppm	0.2	
% SETTLEABLE SOLIDS			Cr, ppm	564	62.8
FLASH POINT °C	>200		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	84		Cu, ppm	74	
PHENOLS, ppm	<2		Hg, ppb	<0.1	
CHLORIDE, ppm			Ni, ppm	318	
BROMIDE, ppm			Pb, ppm	16	0.8
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	—		Zn, ppm	1210	
BOD, ppm			Fe, ppm	3860	
ACIDITY mg/l as $CaCo_3$			PCB, ppm	—	
ALKALINITY, mg/l as $CaCo_3$			Tl, ppm	<0.1	
CYANIDE, ppm (TOTAL)	<10		NH	—	
CYANIDE, ppm (RELEASE)					
SULFIDE, ppm (TOTAL)	<10		TOX, ppm		
SULFIDE, ppm			TOC, ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10)
~~TREATMENT WITH MIX TANK~~ STABILIZATION (100 gm ~~ml~~ WASTE + ~~ml MIX TANK~~) 50 gm LIME + 2 g

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume			IRON, ppm		
% SOLIDS Produced by Weight			NICKEL, ppm		
COD, ppm			ZINC, ppm		
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm		
BORON, ppm			LEAD, ppm		
CADMIUM, ppm			MERCURY, ppb		
CHROMIUM (TOTAL), ppm		0.84	Tl, ppm		
CHROMIUM (HEX), ppm					

ACCEPTED: REJECTED:

COMMENTS: FINAL pH(10%) 11.8

California List
Yes ____ No ____
Please Check

Sent for G C

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS _____
OK ___ ACCEPT ___ REJECT ___
PRICE _____
QUOTE _____

FORM _____
PROJECTES FOOL

WASTE SOURCE VALENTEC
WASTE GENERATOR
WASTE DESCRIPTION ELECTROPLATING FILTER CAKE
RECEIPT DATE VOLUME

WASTE CHARACTERISTICS

COLOR/APPEARANCE	GRAY/BROWN	WATER MISCIBILITY	+
% FLOATER	—	% OIL ON ACIDIFICATION	—
% FREE OIL	—		

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
pH	—		Ag, ppm	2.3	
% TOTAL SOLIDS	36.2		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	<0.1	
% SUSPENDED SOLIDS	[illegible]		Cd, ppm	1.7	0.2
% SETTLEABLE SOLIDS			Cr, ppm	522	48
FLASH POINT °C	>200		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	122		Cu, ppm	196	
PHENOLS, ppm	<2		Hg, ppb	<0.1	
CHLORIDE, ppm			Ni, ppm	200	
BROMIDE, ppm			Pb, ppm	8.4	1.8
PHOSPHATE, ppm (TOTAL)			Se, ppm	<0.1	
COD, ppm	—		Zn, ppm	7200	
BOD, ppm			Fe, ppm	12,800	
ACIDITY mg/l as $CaCo_3$			PCB, ppm	—	
ALKALINITY mg/l as $CaCo_3$			Tl, ppm	3.7	
CYANIDE, ppm (TOTAL)	<10		NH	—	
CYANIDE, ppm (RELEASE)					
SULFIDE, ppm (TOTAL)	<10	<	TOX, ppm		
SULFIDE, ppm			TOC, ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10)
~~TREATMENT WITH MIX TANK~~ STABILIZATION 100 gm ~~ml~~ WASTE + ~~ml MIX TANK~~ 50 gm LIME + 2 gm

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume			IRON, ppm		
% SOLIDS Produced by Weight			NICKEL, ppm		
COD, ppm			ZINC, ppm		
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm		
BORON, ppm			LEAD, ppm		0.34
CADMIUM, ppm		<0.02	MERCURY, ppb		
CHROMIUM (TOTAL), ppm		0.12	Tl, ppm		
CHROMIUM (HEX), ppm			PAINT FILTER		PASS

ACCEPTED: REJECTED:

COMMENTS FINAL pH (10%) 12.0

California List
Yes _____ No _____
Please Check

Sent for G.C

CleanHarbors

ENVIRONMENTAL SERVICES COMPANIES
11800 S. Stony Island Avenue
Chicago, Illinois 60617
(312) 646-6202

LAB ANALYSIS _____
OK ___ ACCEPT ___ REJECT ___
PRICE _____
QUOTE _____

PERMIT # _____
HAZ CODES 4062

WASTE SOURCE AUTORAD
WASTE GENERATOR
WASTE DESCRIPTION PICKLING SLUDGE
RECEIPT DATE _____ VOLUME _____

WASTE CHARACTERISTICS

COLOR/APPEARANCE	YELLOW SOLID	WATER MISCIBILITY	+
% FLOATER	—	% OIL ON ACIDIFICATION	—
% FREE OIL	—		

TEST	As Rec.	LEACH	TEST	As Rec.	TCLP
pH	—		Ag, ppm	<0.1	
% TOTAL SOLIDS	21.1		As, ppm	<0.1	
% DISSOLVED SOLIDS			Ba, ppm	3.2	
% SUSPENDED SOLIDS	100		Cd, ppm	2.0	
% SETTLEABLE SOLIDS			Cr, ppm	1240	4.8
FLASH POINT °C	>200		Cr (Hex), ppm	—	
OIL AND GREASE, ppm	<10		Cu, ppm	274	
PHENOLS, ppm	<10		Hg, ppb	<0.1	
CHLORIDE, ppm			Ni, ppm	835	
BROMIDE, ppm			Pb, ppm	480	2.3
PHOSPHATE, ppm (TOTAL)			Se, ppm	0.2	
COD, ppm	—		Zn, ppm	8230	
BOD, ppm			Fe, ppm	14600	
ACIDITY mg/l as $CaCo_3$			PCB, ppm	—	
ALKALINITY mg/l as $CaCo_3$			Tl, ppm	<0.1	
CYANIDE, ppm (TOTAL)	<10		NH	—	
CYANIDE, ppm (RELEASE)					
SULFIDE, ppm (TOTAL)	<10		TOX, ppm		
SULFIDE, ppm			TOC, ppm		

TREATMENT CHARACTERISTICS

NEUTRALIZATION EQUIVALENT (pH 10)
~~TREATMENT WITH MIX TANK~~ STABILIZATION (100 ~~ml~~ gm WASTE + ~~ml MIX TANK~~ 50 gm LIME + 2 gm

TEST	MIX TANK	MIX + Sample		MIX TANK	MIX + Sample
% SOLIDS Produced by Volume			IRON, ppm		
% SOLIDS Produced by Weight			NICKEL, ppm		
COD, ppm			ZINC, ppm		
CYANIDE (TOTAL), ppm			O&G, ppm		
CYANIDE (RELEASABLE), ppm			COPPER, ppm		
BORON, ppm			LEAD, ppm		0.13
CADMIUM, ppm			MERCURY, ppb		
CHROMIUM (TOTAL), ppm		0.056	Tl, ppm		
CHROMIUM (HEX), ppm			PAINT FILTER		PASSED

ACCEPTED: _____ REJECTED: _____

COMMENTS FINAL pH (10%) 11.8

California List
Yes _____ No _____
Please Check

Sent for G.C.

CLEAN HARBORS STABILIZATION RECIPE DEVELOPMENT

GENERATOR: _____ TRIAL# total digest

WASTE PROFILE# _____ CLEAN HARBOR SAMPLE #: _____

HAZARDOUS WASTE CODE(S): F006

	WASTE/REAGENT	WEIGHT(g)	MIX RATIO
	WASTE	1.9982g	
Rgnt #1 :	---		
Rgnt #2 :			
Rgnt #3 :			
RGNT #4;			

TOTAL WEIGHT (WASTE + REAGENTS): _____

WEIGHT OF TCLP #2 solution: _____

NOTE: MIX RATIO EQUALS WEIGHT OF THE MIXTURE DIVIDED BY WEIGHT OF WASTE. WEIGHT OF TCLP #2 SOLUTION SHOULD EQUAL 20X TOTAL WEIGHT OF WASTE AND REAGENTS.

STIRRING TIME: ____(hrs) ____(min.) FINAL pH: _____

PARAMETER	RESULT (ppm)	TREATMENT STANDARD (ppm)
Se		
Ag		.072ppm
As		
Ba		
Cd	.324	.066 ppm
Cr	338.	5.2 ppm
Hg		
NI	.362	0.32 ppm
pb	252.	0.51 ppm

CLEAN HARBORS STABILIZATION RECIPE DEVELOPMENT

GENERATOR: _____ TRIAL# total digest

WASTE PROFILE# _____ CLEAN HARBOR SAMPLE #: _____

HAZARDOUS WASTE CODE(S): F006

	WASTE/REAGENT	WEIGHT(g)	MIX RATIO
	WASTE	1.9982g	
Rgnt #1 :	---		
Rgnt #2 :			
Rgnt #3 :			
RGNT #4;			

TOTAL WEIGHT (WASTE + REAGENTS): _____

WEIGHT OF TCLP #2 solution: _____

NOTE: MIX RATIO EQUALS WEIGHT OF THE MIXTURE DIVIDED BY WEIGHT OF WASTE. WEIGHT OF TCLP #2 SOLUTION SHOULD EQUAL 20X TOTAL WEIGHT OF WASTE AND REAGENTS.

STIRRING TIME: ____(hrs) ____(min.) FINAL pH: _____

PARAMETER	RESULT (ppm)	TREATMENT STANDARD (ppm)
Se		
Ag		.072ppm
As		
Ba		
Cd	.324	.064 ppm
Cr	338.	5.2 ppm
Hg		
NI	.362	0.32 ppm
pb	252.	0.51 ppm

CLEAN HARBORS STABILIZATION RECIPE DEVELOPMENT

GENERATOR: _____ TRIAL# total digest

WASTE PROFILE# _____ CLEAN HARBOR SAMPLE #: _____

HAZARDOUS WASTE CODE(S): F006

	WASTE/REAGENT	WEIGHT(g)	MIX RATIO
	WASTE	1.9982g	
Rgnt #1 :	---		
Rgnt #2 :			
Rgnt #3 :			
RGNT #4;			

TOTAL WEIGHT (WASTE + REAGENTS): _____

WEIGHT OF TCLP #2 solution: _____

NOTE: MIX RATIO EQUALS WEIGHT OF THE MIXTURE DIVIDED BY WEIGHT OF WASTE. WEIGHT OF TCLP #2 SOLUTION SHOULD EQUAL 20X TOTAL WEIGHT OF WASTE AND REAGENTS.

STIRRING TIME: ____(hrs) ____(min.) FINAL pH: _____

PARAMETER	RESULT (ppm)	TREATMENT STANDARD (ppm)
Se		
Ag		.072ppm
As		
Ba		
Cd	.324	.066 ppm
Cr	338.	5.2 ppm
Hg		
NI	.362	0.32 ppm
pb	252.	0.51 ppm

CLEAN HARBORS STABILIZATION RECIPE DEVELOPMENT

GENERATOR: _____ TRIAL# total digest

WASTE PROFILE# _____ CLEAN HARBOR SAMPLE #: _____

HAZARDOUS WASTE CODE(S): F006

	WASTE/REAGENT	WEIGHT(g)	MIX RATIO
	WASTE	1.9982g	
Rgnt #1 :	---		
Rgnt #2 :			
Rgnt #3 :			
RGNT #4;			

TOTAL WEIGHT (WASTE + REAGENTS): _____

WEIGHT OF TCLP #2 solution: _____

NOTE: MIX RATIO EQUALS WEIGHT OF THE MIXTURE DIVIDED BY WEIGHT OF WASTE. WEIGHT OF TCLP #2 SOLUTION SHOULD EQUAL 20X TOTAL WEIGHT OF WASTE AND REAGENTS.

STIRRING TIME: ____(hrs) ____(min.) FINAL pH: _____

PARAMETER	RESULT (ppm)	TREATMENT STANDARD (ppm)
Se		
Ag		.072ppm
As		
Ba		
Cd	.324	.064 ppm
Cr	338.	5.2 ppm
Hg		
NI	.362	0.32 ppm
pb	252.	0.51 ppm

CLEAN HARBORS STABILIZATION RECIPE DEVELOPMENT

GENERATOR: _____ TRIAL# total digest

WASTE PROFILE# _____ CLEAN HARBOR SAMPLE #: _____

HAZARDOUS WASTE CODE(S): F006

	WASTE/REAGENT	WEIGHT(g)	MIX RATIO
	WASTE	1.9982g	
Rgnt #1 :	---		
Rgnt #2 :			
Rgnt #3 :			
RGNT #4;			

TOTAL WEIGHT (WASTE + REAGENTS): _____

WEIGHT OF TCLP #2 solution: _____

NOTE: MIX RATIO EQUALS WEIGHT OF THE MIXTURE DIVIDED BY WEIGHT OF WASTE. WEIGHT OF TCLP #2 SOLUTION SHOULD EQUAL 20X TOTAL WEIGHT OF WASTE AND REAGENTS.

STIRRING TIME: ____(hrs) ____(min.) FINAL pH: _____

PARAMETER	RESULT (ppm)	TREATMENT STANDARD (ppm)
Se		
Ag		.072 ppm
As		
Ba		
Cd	.324	.066 ppm
Cr	338.	5.2 ppm
Hg		
NI	.362	0.32 ppm
pb	252.	0.51 ppm

CLEAN HARBORS STABILIZATION RECIPE DEVELOPMENT

GENERATOR: _____ TRIAL# total digest

WASTE PROFILE# _____ CLEAN HARBOR SAMPLE #: _____

HAZARDOUS WASTE CODE(S): F006

	WASTE/REAGENT	WEIGHT(g)	MIX RATIO
	WASTE	1.9982g	
Rgnt #1 :	---		
Rgnt #2 :			
Rgnt #3 :			
RGNT #4;			

TOTAL WEIGHT (WASTE + REAGENTS): _____

WEIGHT OF TCLP #2 solution: _____

NOTE: MIX RATIO EQUALS WEIGHT OF THE MIXTURE DIVIDED BY WEIGHT OF WASTE. WEIGHT OF TCLP #2 SOLUTION SHOULD EQUAL 20X TOTAL WEIGHT OF WASTE AND REAGENTS.

STIRRING TIME: ____(hrs) ____(min.) FINAL pH: _____

PARAMETER	RESULT (ppm)	TREATMENT STANDARD (ppm)
Se		
Ag		.072 ppm
As		
Ba		
Cd	.324	.064 ppm
Cr	338.	5.2 ppm
Hg		
NI	.362	0.32 ppm
pb	252.	0.51 ppm

CLEAN HARBORS STABILIZATION RECIPE DEVELOPMENT

GENERATOR: _____ TRIAL# total digest

WASTE PROFILE# _____ CLEAN HARBOR SAMPLE #: _____

HAZARDOUS WASTE CODE(S): F006

	WASTE/REAGENT	WEIGHT(g)	MIX RATIO
	WASTE	1.9982g	
Rgnt #1 :	---		
Rgnt #2 :			
Rgnt #3 :			
RGNT #4;			

TOTAL WEIGHT (WASTE + REAGENTS): _____

WEIGHT OF TCLP #2 solution: _____

NOTE: MIX RATIO EQUALS WEIGHT OF THE MIXTURE DIVIDED BY WEIGHT OF WASTE. WEIGHT OF TCLP #2 SOLUTION SHOULD EQUAL 20X TOTAL WEIGHT OF WASTE AND REAGENTS.

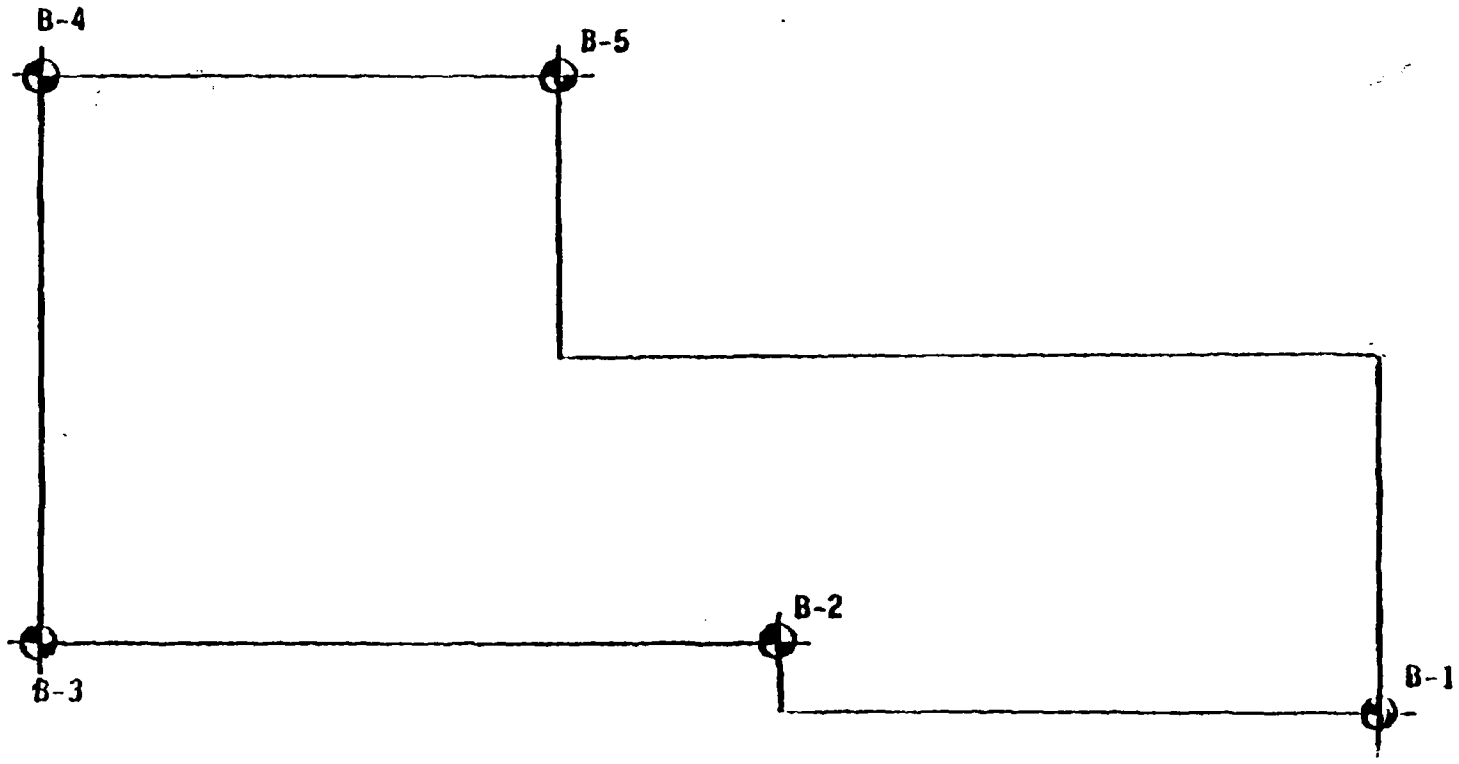
STIRRING TIME: ____(hrs) ____(min.) FINAL pH: _____

PARAMETER	RESULT (ppm)	TREATMENT STANDARD (ppm)
Se		
Ag		.072 ppm
As		
Ba		
Cd	.324	.064 ppm
Cr	338.	5.2 ppm
Hg		
NI	.362	0.32 ppm
pb	252.	0.51 ppm

APPENDIX

JN-11-1991 09:10 FROM HOVER SCHLESINGER TURNER TO 859716 P.07

Professional Service Industries



PROJECT NAME		PROJECT NO.
Proposed Storage Building Clean Harbors Chicago, Illinois	SOIL BORING LOCATION PLAN	152-05039
		DATE June 21 1990

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-1

Project Name: Proposed Storage Building — Date of Boring: June 13, 1990

Site: Clean Harbors, Chicago, Illinois — Project No.: 152-05039

DESCRIPTION	DEPTH (feet)	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
Brown SILT with fine sand and gravel FILL		1AS				28.8	
Medium dense gray and white SILT fine to medium sand Organics, discoloration and odor noted FILL		2SS	15			28.9	
Medium dense bluish gray clayey SILT, possible marl. Organic discoloration and odor noted FILL	5	3SS	8		0.8	67.1	
Dense black fine to medium SAND with gravel Organic, discoloration and odor noted FILL		4SS	16			70.0	
Very dense light bluish gray SILT, some gravel Discoloration and odor noted	10	5SS	145/7"			59.5	
Auger refusal at 13.5'		6SS	100/0"				
Groundwater Readings: Dry while drilling 12' after casing removal	15						
	20						

1/89 :00

JUN-11-1991 09:11 FROM HOYER SCHLESINGER TURNER TO 869716 P.09
JV DT:CleanHarbors/Crown 6F11 6-11-91 10:11AM 2630820- 6177869716:# 9

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-2

Project Name: Proposed Storage Building — Date of Boring: June 13, 1990

Site: Clean Harbors, Chicago, Illinois — Project No.: 152-05039

DESCRIPTION	DEPTH (feet)	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
Brown silty CLAY, trace sand and gravel FILL		1AS				56.6	
Medium dense light gray and white SILT POSSIBLE FILL Organics Discoloration and odor noted		2SS	9			59.0	
	5						
Dense dark gray SILT with sand and gravel Discoloration and odor noted		3SS	20			69.2	
Medium dense to very dense black and brown clayey SILT Possibly peaty Wet		4SS	18			45.9	
	10						
		5SS	13			52.0	
Auger refusal at 13'7"		6SS	100/1"			16.7	
	15						
Groundwater Readings: 5' while drilling 12.5' before casing removal 8' after casing removal							
	20						

1/89 500

JUN-11-1991 09:11 FROM HOVER SCHLESINGER TURNER TO 859716 P.10

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-3

Project Name: Proposed Storage Building — Date of Boring: June 13, 1990

Site: Clean Harbors, Chicago, Illinois — Project No.: 152-05039

DESCRIPTION	DEPTH (feet)	SAMPLE	N	q_u	q_p	M_c	REMARKS
SURFACE							
Brown silty CLAY, some gravel organics FILL		1AU				65.0	
Very dense bluish gray SILT organics, odor noted POSSIBLE FILL	5	2SS	62/8"			90.8	
		3SS	15			61.8	
Medium dense light blue, black and white clayey SILT, fine to coarse sand and gravel, odor noted	10	4SS	9			68.2	
Very dense bluish gray SILT with gravel		5SS	59			65.4	
Auger refusal at 13.5'	15	6SS	50/0"				
Groundwater Readings: 7.5' while drilling 7' before casing removal 7' after casing removal	20						

JUN-11-1991 09:12 FROM HOYER SCHLESINGER TURNER TO 869716 2630820- 6177869716:#11 P.11

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-4

Project Name: Proposed Storage Buiding
Date of Boring: June 13, 1990
Site: Clean Harbors, Chicago, Illinois
Project No.: 152-05039

DESCRIPTION	DEPTH (feet)	SAMPLE	N	Q_u	Q_p	M_c	REMARKS
SURFACE							
Brown SILT with fine to coarse sand and gravel FILL		1AU				29.6	
Very dense bluish gray SILT with sand, organics Discoloration and odor noted POSSIBLE FILL		2SS	35			80.8	
	5						
Medium dense black and brown clayey SILT, possibly peaty, organic, odor noted		3SS	14			57.1	
Dense black SILT with fine to coarse SAND, odor noted		4SS	20			72.8	
	10						
Dark brown clayey PEAT, organic		5SS	4			80.0	
Bluish gray SILT with clay							
Very dense fine to medium SAND, some weathered rock		6SS	90/8"			60.2	
	15						
Bottom of boring at 15'							
Groundwater Readings:							
13' while drilling							
13' after casing removal							
	20						

JUN-11-1991 09:12 FROM HOVER SCHLESINGER TURNER TO 869716 2630820- 6177869716:#12 P.12

Professional Service Industries, Inc.

RECORD OF SUBSURFACE EXPLORATION

Boring B-5

Project Name: Proposed Storage Building — Date of Boring: June 13, 1990

Site: Clean Harbors, Chicago, Illinois — Project No.: 152-05039

DESCRIPTION	DEPTH (feet)	SAMPLE	N	q_u	q_p	M_c	REMARKS
SURFACE							
Brown sandy SILT, fine gravel FILL		1AS				53.3	
Very dense bluish gray SILT, trace clay, odor and discoloration noted		2SS	31			111.9	
	5	3SS	26			37.6	
POSSIBLE FILL							
Black, gray and white clayey SILT, odor noted		4SS	6			38.0	
	10	5SS	12			82.1	
Medium dense black SILT							
Very dense dark brown silty SAND		6SS	72/8"				
	15						
Bottom of boring at 15' No groundwater encountered while drilling							
	20						

1/89 500

JUN-11-1991 09:12 FROM HOYER SCHLESINGER TURNER TO 869716 P.13

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System is used to identify the soil unless otherwise noted.

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2 inch O.D. split-spoon.

Qu: Unconfined compressive strength, TSF

Qp: Penetrometer value, unconfined compressive strength, TSF

Mc: Water content, %

LL: Liquid limit, %

PI: Plasticity index, %

δ d: Natural dry density, PCF

▼: Apparent groundwater level at time noted after completion.

DRILLING AND SAMPLING SYMBOLS

SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
ST: Shelby Tube - 3" O.D., except where noted.
AU: Auger Sample.
DB: Diamond Bit.
CB: Carbide Bit.
WS: Washed Sample.

RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION

TERM (NON-COHESIVE SOILS)	STANDARD PENETRATION RESISTANCE
Very Loose	0 - 2
Loose	2 - 4
Slightly Compact	4 - 8
Medium Dense	8 - 16
Dense	16 - 26
Very Dense	Over 26

TERM (COHESIVE SOILS)	Qu - (TSF)
Very Soft	0 - 0.25
Soft	0.25 - 0.50
Firm (Medium)	0.50 - 1.00
Stiff	1.00 - 2.00
Very Stiff	2.00 - 4.00
Hard	4.00+

PARTICLE SIZE

Boulders	8 in. +	Coarse Sand	5mm-0.6mm	Silt	0.074mm-0.005mr
Cobbles	8 in.-3 in.	Medium Sand	0.6mm-0.2mm	Clay	-0.005mr
Gravel	3 in.-5mm	Fine Sand	0.2mm-0.074mm		

SPECIFICATION

FOR

THE PLACING AND COMPACTING OF CONTROLLED FILL

General

The successful construction of a stable fill will depend upon the proper preparation of the subgrade, the materials selected for use and the type of equipment utilized for compaction. In addition, the control of moisture will be important if the required densities are to be obtained with a minimum of effort.

Site Preparation

The effectiveness of the new backfill will depend largely upon the stability of the natural subgrade soils. The procedures outlined below should be undertaken.

Excavation of Poor Soils

Prior to the placing of any new fill, all topsoil, organic soils, frozen materials, existing uncontrolled fill and obviously compressible soils must be removed.

Where excavations are made for the removal of the deleterious materials, it will be necessary to maintain them in a relatively dry and workable condition, so that the moisture content of the backfill can be controlled while it is being placed. If the subgrade soils are soft clays, they must be removed or disced and harrowed to aerate and dry the soils. These soils must be subsequently compacted to the same minimum density as the new fill.

JUN-11-1991 09:13 FROM HOYER SCHLESINGER TURNER TO 869716 P.15

Ground Water Control

The contractor shall provide, maintain and operate equipment, trenches and pumping as required to reduce the water table in isolated areas. He shall not permit soil solids to be removed together with the water, and the discharge must be located a suitable distance form the excavation.

Proof Compaction

All subgrade in cut areas shall be rolled and compacted as specified to produce a compaction equivalent to that of the filled areas. Surfaces to be filled shall also be compacted before placing fill.

Where required, the subgrade will be proof compacted until it offers a relatively unyielding surface. Proper equipment shall be used for this operation.

If this proof compaction causes water to remove to the surface or if it causes the subgrade to "pump" or to become unstable, the proof compacting should be stopped and the geotechnical engineer consulted.

Materials

All fills shall be made with approved materials free of vegetable matter, wood, debris and frozen material. The fill should be constructed by placing loose and uniformly thick, for the full width of the lift, layers of not more than 9 inches depth before compaction. Materials shall be thoroughly and uniformly moistened or dried to achieve uniform and optimum compaction.

Where on-site cohesive materials are used, those soils which contain excessive amounts of silt or water, should be discarded as it will be virtually impossible to compact them to the required density.

If new fill is brought to the site, it should preferably consist of a granular soil, free from organic or other deleterious materials.

Placing

The upper (six) 6 inches of the subgrade should be disced and harrowed if it is in a wet condition. No fill shall be placed upon wet ground or where there is standing water. No frozen material shall be used for fill and no fill shall be placed on frozen ground.

The select fill shall be placed in layers not exceeding nine (9) inches of loose thickness and thoroughly compacted prior to placing of the next layer.

Each layer shall be compacted as soon as possible after placing. Any compacted ruts in the layer, due to traveling or hauling equipment, shall be harrowed, if required, so that the compacting equipment shall operate over a uniform layer.

The surface of the fill should be pitched slightly to promote surface run-off of rainfall.

At the completion of each workday, the surface of the fill should be smoothed and sloped to minimize infiltration and absorption of rainwater.

Compacting Equipment

Non-Cohesive Fills - Where the fill consists of sand or gravel materials, compacting equipment shall consist of pneumatic-tired or steel wheel rollers, either of the vibratory or static loaded type. The effective load shall be not less than 325 pounds per rated width, or 4,000 pounds per foot of drum length, for compaction of a layer 9 inches in thickness. For lesser pressures, the thickness of the lift will be reduced, but in no case shall the pressure be less than 200 pounds per inch, or 2,400 pounds per foot of tire or drum width.

Pneumatic rollers shall consist of two axles, on which there are mounted not less than nine pneumatic tires, in a manner such that the rear wheels will not follow in the track of the forward group. The roller should have a rigid frame provided with a platform for carrying the vibratory equipment or ballast.

Cohesive Soil Fills - Where cohesive soils are used as fill, each layer shall be compacted with a sheepsfoot roller. The rollers shall have staggered rows of feet, projecting not less than 7 inches form the drum, and shall be loaded to contact with the soil.

Limited Areas of Compaction - In limited areas, or where backfill is to be placed against foundation walls, or where narrow trenches are to be backfilled, only granular fill shall be used. This will be compacted with a portable vibrating plate of compactor.

JUN-11-1991 09:15 FROM HOYER SCHLESINGER TURNER TO 869716 P.16

Other Compacting Equipment - Combinations of the above methods, or other methods capable of producing equivalent results with the available fill material, may be used depending on the characters of the material, and with approval of the engineer.

In the event that heavy duty vibrating compactors or other special equipment is used, the thickness of the layers may be changed with the approval of the architect, engineer or soils consultant, provided tests shown equivalent compaction is obtained.

No flooding of the subgrade to achieve compaction will be permitted.

Moisture Content

All fill shall be compacted at not more than two percentage points below, nor more than three percentage points above the optimum moisture content, unless prior permission to vary this is obtained from the engineer.

Material that is too wet to permit proper compaction may be stockpiled or be spread on the fill and permitted to dry. Discing, harrowing or pulverizing may be necessary, until the moisture content is reduced to a satisfactory value, after which it shall be compacted.

The contractor shall provide and operate suitable equipment to add moisture to the fill layers and to uniformly distribute water throughout the layer.

Density Requirements

Compaction procedures, previously described, shall continue until the required density of 95 percent has been obtained in areas receiving foundation loads. A minimum of 95 percent must be achieved in areas supporting floor and pavement loads only and minimum densities of 90 percent must be reached in landscaped areas.

If considerable variations occur in the subgrade due to: changes in the character of the fill, fluctuations in moisture contents or density test results, the contractor may be required to proof roll the finished grade until a relatively unyielding surface is obtained. Any areas showing excessive deflection shall be sub-cut, backfilled with stable soil and recompacted, at the contractor's expense.

The compaction densities are based on the A.S.T.M. D-1557 test value (also known as A.A.S.H.T.O. T-180). Other requirements, or the use of other standards, may be authorized by the architect, engineer, or soils consultant, to suit particular conditions.

Testing and Inspection

The owner will employ the services of a soils consultant, thoroughly experienced in soil mechanics, for the testing and inspection of work included under this section of the specification.

The soils consultant will assist the earthwork contractor and advise him with respect to this equipment and procedures.

The consultant shall approve all materials, equipment and procedures used for the site preparation and construction of fill.

SUBSURFACE INVESTIGATION
for the
Proposed Development
Clean Harbors of Chicago
Chicago, Illinois

INTRODUCTION

We have completed the subsurface investigation for the proposed development to be located at Clean Harbors of Chicago, Chicago, Illinois. The results of the four (4) soil borings performed at the site, along with a location diagram and general notes, are included with this report.

Boring locations and relative elevations were determined by field personnel without the aid of sophisticated surveying techniques and as such are considered to be approximate.

It is our understanding that the proposed development will include a new process building, tank storage areas, drum compaction area, roll off container area and drum crushing area. Light to moderate loads are anticipated for the new structures. Maximum loads for the tank storage areas are anticipated to be on the order of 160 kips with light to moderate loads anticipated for the remaining structures. It is anticipated that proposed grades will be approximately equivalent to existing grades.

The purpose of this report is to describe the soil conditions encountered in the borings, to analyze and evaluate the data obtained, and to submit recommendations regarding the design and construction of the foundations for the proposed structures.

SUBSURFACE INVESTIGATION PROCEDURES

The soil borings were performed on May 13 and 14, 1991 with a CME drilling rig and were advanced by means of continuous flight augers. Representative samples were obtained employing split spoon sampling procedures in accordance with ASTM Specification D-1586. Samples obtained in the field were returned to our laboratory for further examination and testing.

Split spoon sampling involves driving a 2.0 inch outside diameter split-barrel sampler into the soil with a 140-pound weight falling freely through a distance of 30 inches. The number of blows required to advance the sampler the last 12 inches is termed the Standard Penetration Resistance (N) and is included on the boring logs. The N value is an indication of the relative density of the soil.

TESTING PROGRAM

The testing program consisted of performing water content and calibrated penetrometer tests on the cohesive samples recovered. Water content tests were performed on the fill materials recovered. These tests were performed upon representative portions of the samples obtained in the field. The results of all testing performed, along with a visual classification of the material based upon both a textural

analysis and the Unified Soil Classification System, are indicated on the boring logs.

SOIL CONDITIONS

Specific soil conditions encountered in the borings are indicated on the soil boring logs. As indicated on the logs, a miscellaneous loose to very dense fill was encountered at the ground surface and extended to a depth of 18.5' to 23.0' below ground surface. The fill appears to consist primarily of cinder, sand, silt, clay and organics, and typically had relatively high moisture contents. The fill materials were underlain by tough to very tough, gray silty clay soils that extended to the maximum depth of the borings, 35.0' below ground surface. The stratification lines shown on the boring logs represent the approximate boundary between soil types and the actual transition may be gradual.

WATER TABLE CONDITIONS

Water level readings were taken during drilling and after the completion of the borings. Ground water was encountered at a depth of 5.0' to 20.0' below ground surface during the drilling operation. After completion of the borings, water was noted at a depth of 10.0' to 18.0' below ground surface.

These readings are shown on the boring logs and, along with

local hydrogeologic information, indicate that the phreatic surface is at a depth of approximately 6.0' to 9.0' below the existing ground surface. Fluctuations in the amount of water accumulated and in the hydrostatic water table should be anticipated, depending upon variations in precipitation and surface runoff.

ANALYSIS AND RECOMMENDATIONS

Based on the information obtained from the borings performed at the site and the type of loadings anticipated for the proposed structures, a deep foundation such as piles or caissons may be most appropriate for the structures with the higher loads. The existing fill materials have high insitu moisture contents and appear to contain significant organics, which create the potential for detrimental settlement. However, because the fill is relatively dense, it may be possible to support the lightly loaded structures using footing foundations.

For a footing foundation, the existing fill should be removed to a depth of approximately 5.0' to 6.0' below ground surface and replaced with a compacted fill. The excavation can then be backfilled with an approved fill material placed in lifts not exceeding 9" in loose thickness and compacted to a recommended minimum 95% of ASTM D-1557 density. The fill can consist of a clean inorganic granular material such as a CA-6 gradation

crushed stone, or a silty clay material. The fill should extend a minimum of 1' beyond the outside edge of the foundation for each foot of fill placed. A maximum net allowable soil bearing pressure of 1,5000 psf is recommended for design of the foundations. The exterior footings should also be located a minimum of 3.5' below finished grade for adequate frost cover protection. By situating the footings within the fill, the potential for settlement still exists and should be taken into consideration when designing the structure.

Regarding the deep foundation, a pipe or H-pile foundation system appears to be the most appropriate pile type foundation for the proposed structures. However, because a well defined bearing stratum was not encountered below the fill, detailed recommendations regarding a pile and caisson foundation cannot be provided. Additional deeper borings should be performed to determine the depth to suitable bearing material and better define the characteristics of the fill material relative to installation of a deep foundation system.

Because of the depth of the water table, some problems resulting from ground water infiltration may occur during construction. The type of dewatering system will depend upon the type of foundation system selected, however, it is anticipated that standard sump pump and pit procedures will be

adequate for a footing type foundation system. Any surface water which accumulates in foundation excavations during construction, along with any softened, disturbed or frozen soil, should be removed prior to the placement of any concrete.

The analysis and recommendations submitted in this report have been based upon available information. Because of the fill and soil conditions encountered, it is recommended that the foundation excavation and backfilling be inspected by a representative of O'Brien & Associates, Inc. We would welcome the opportunity to provide this recommended service for you to assure that sufficient information is available to select the best foundation type for each of the proposed structures.

This report has been based upon our understanding of the scope of the work of the project. Any changes in the design or location should be brought to our attention so that we might determine if these changes affect our recommendations.

GENERAL NOTES

CLASSIFICATION

Chicago Building Code Textural Soil Classifications and Unified Soil Classifications are used.

GENERAL

Trace	: 1% to 10%
Trace to some	: 10% to 20%
Some	: 20% to 35%
And	: 35% to 50%

Cohesionless Soils

Loose	: 0 to 9 blows	) or
Medium Dense	: 10 to 29"	) equiv-
Dense	: 30 to 59"	) alent
Very Dense	: over 60"	)

Cohesive Soils

If clay content is sufficient so that clay dominates soil properties, then clay becomes the principal noun with other major soil constituent as modifier: i.e., silty clay. Other minor soil constituents may be added according to classification breakdown for cohesionless soils: i.e., silty clay, trace to some sand, trace gravel.

Soft	: 0.00 - 0.59 tons/ft.^{2}
Stiff	: 0.60 - 0.99 tons/ft.^{2}
Tough	: 1.00 - 1.99 tons/ft.^{2}
Very tough	: 2.00 - 3.99 tons/ft.^{2}
Hard	: over 4.00 tons/ft.^{2}

DRILLING AND SAMPLING SYMBOLS

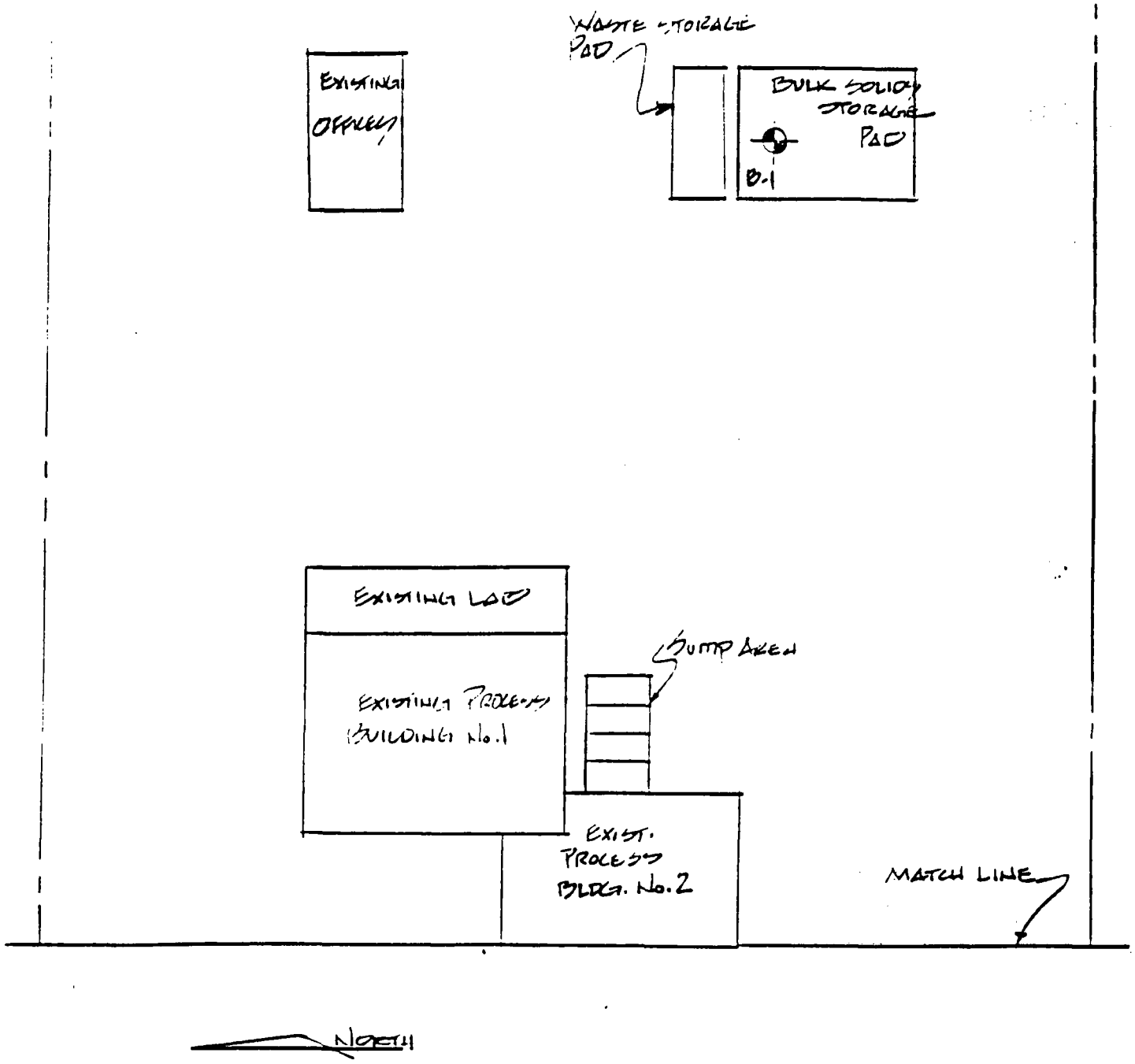
SS:	Split spoon 1-3/8" I.D., 2" O.D.	HS:	Housel Sampler
ST:	Shelby tube 2: o.d., except where	WS:	Wash Sample
AS:	Auger Sample	FT:	Fish Tail
DB:	Diamond Bit - NX: BX: AX	RB:	Rock Bit
CB:	Carboloy Bit - NX: BX: AX	WO:	Wash Out
OS:	Osterberg Sampler		

Standard "N" Penetration: Blows per foot of a 140 lb. hammer falling 30" on a 2" O.D. Split Spoon

WATER LEVEL MEASUREMENT SYMBOLS

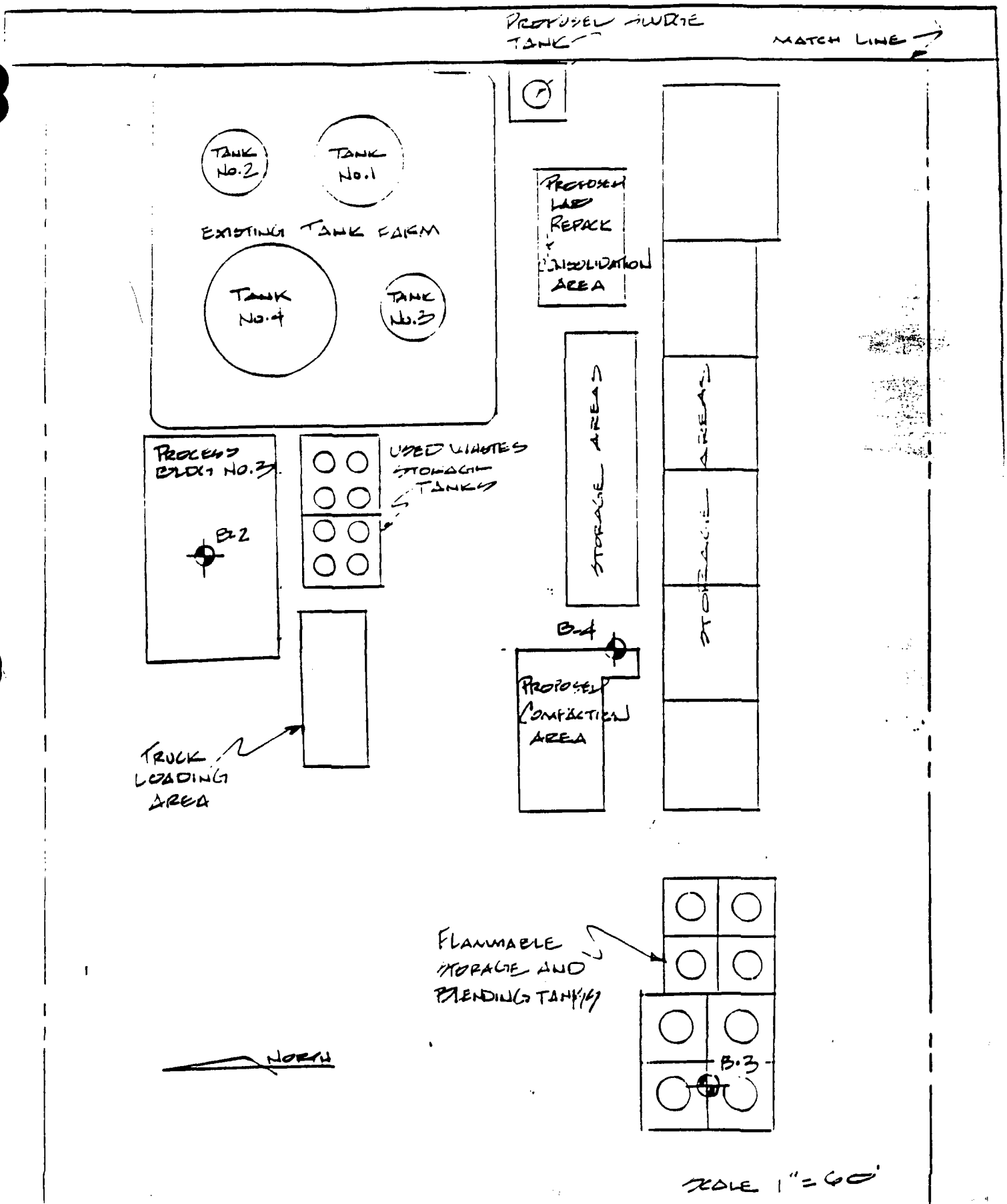
WL :	Water	WD:	While Drilling
WCI:	Wet Cave In	BCR:	Before Casing Removal
DCI:	Dry Cave In	ACR:	After Casing Removal
WS :	While sampling	AB:	After Boring

Water levels indicated on the boring logs are the levels measure in the boring at the times indicated. In pervious soils, th indicated elevations are considered reliable ground water levels In impervious soils, the accurate determination of ground wate elevations is not possible in even several days observation, an additional evidence on ground water elevations must be sought.



SCALE 1" = 60'

SOIL BORING LOCATION DIAGRAM	O'BRIEN & ASSOCIATES, INC.	DRAWN BY	CKB
SHEET 1 OF 2	CONSULTING ENGINEERS	APPROVED BY	DMB
CLEAN HARBORS OF CHICAGO	P.O. BOX 1231	DATE	5/29/91
CHICAGO ILLINOIS	ARLINGTON HEIGHTS, ILLINOIS (708) 398-1441	JOB NO.	91261



SOIL BORING LOCATION DIAGRAM	O'BRIEN & ASSOCIATES, INC.	DRAWN BY	CKD
SHEET 2 OF 2	CONSULTING ENGINEERS	APPROVED BY	DOB
CLEAN HARBORS OF CHICAGO	P.O. BOX 1231	DATE	5/29/91
CLEAN HARBORS	ARLINGTON HEIGHTS, ILLINOIS (708) 398-1441	JOB NO.	91261

LOG OF BORING NO. B-1

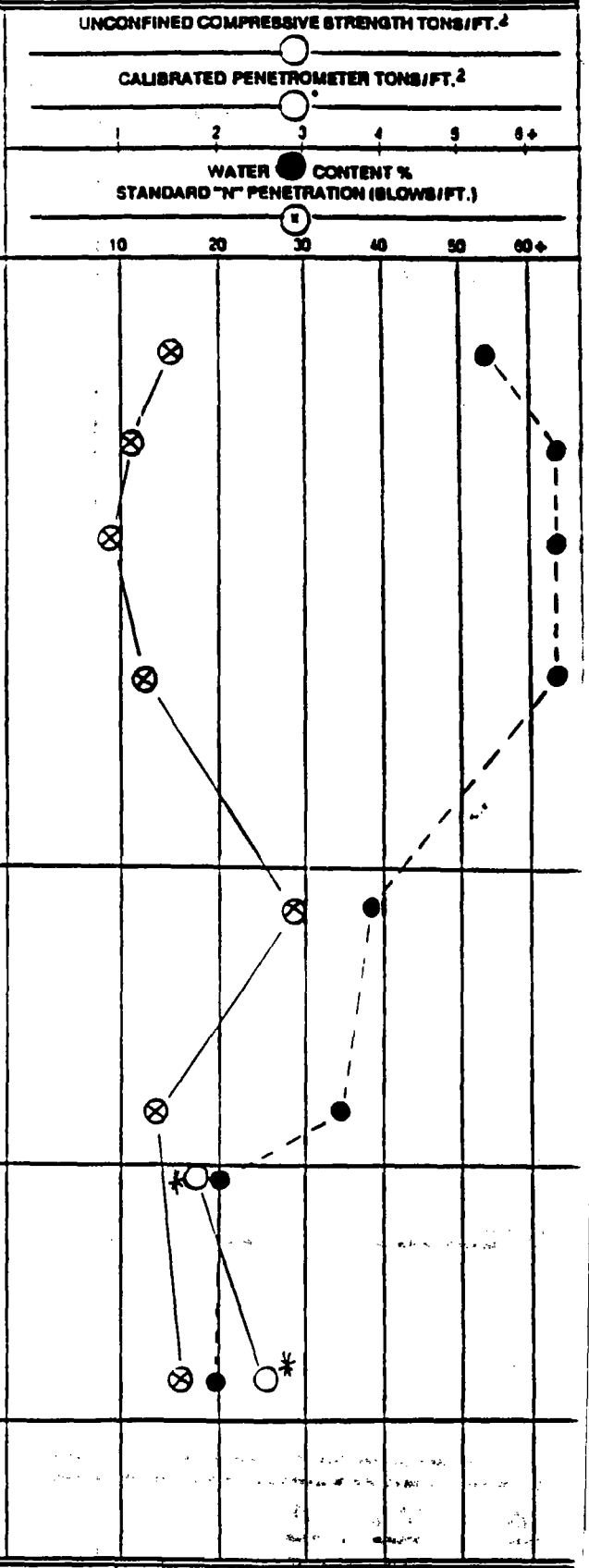
CLIENT
Clean Harbors of Chicago

ARCHITECT-ENGINEER

LOCATION
Chicago, Illinois

PROJECT DESCRIPTION
Proposed development

DEPTH BELOW GROUND SURFACE	SAMPLE NO.	TYPE SAMPLE	SAMPLE DISTANCE	SAMPLE RECOVERY	DESCRIPTION OF MATERIAL / GROUND SURFACE ELEVATION	UNIT DRY WT. LBS./FT.³
	1	ss			Misc. cinder, stone, sand & organics-gray to dark gray-loose to medium dense (Fill) Chemical odor	
5.0	2	ss				
	3	ss				
	4	ss				
10.0						
15.0	5	ss			Misc. sand and organics-dark gray and black-medium dense (Fill) Chemical odor	
	6	ss				
20.0	6a				Silty clay-trace sand and gravel-gray-tough to very tough (CL)	
25.0	7	ss				
					End of Boring	



WATER LEVEL OBSERVATIONS

W.L.	-7.0' wa
W.L.	-20.0' bcr
	-19.5' acr

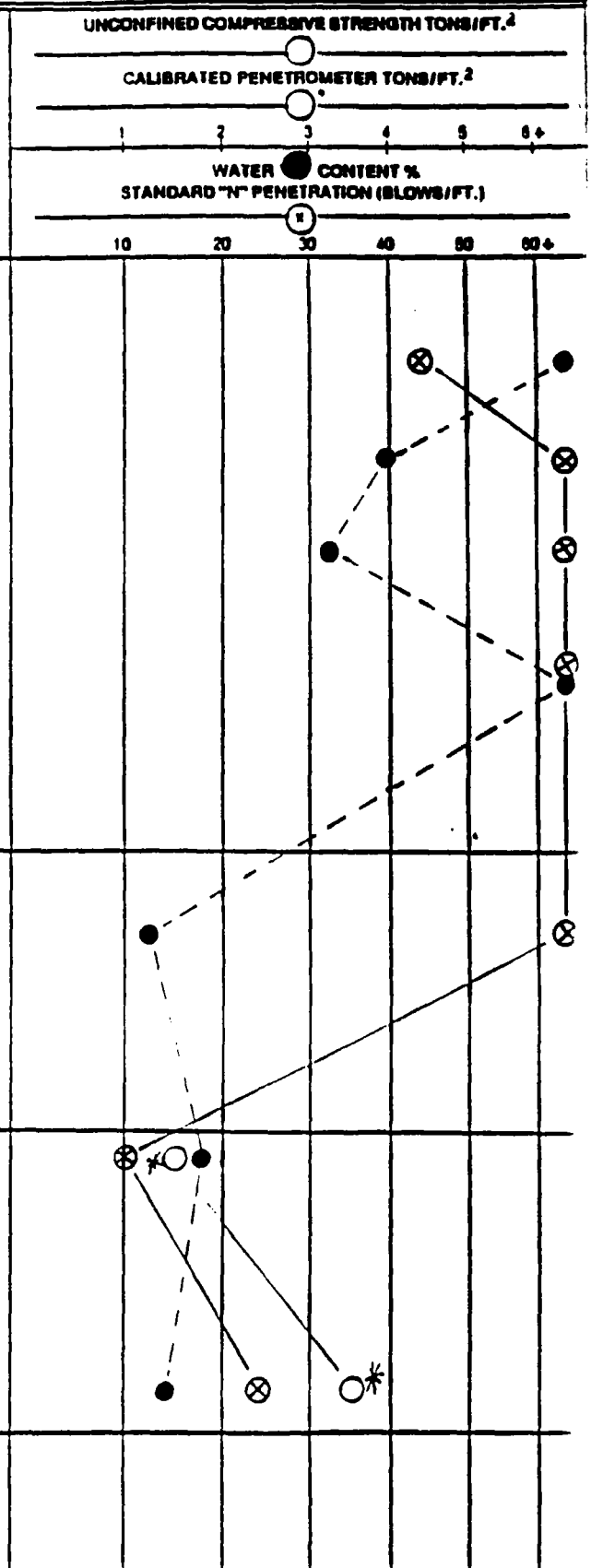
O'BRIEN & ASSOCIATES, INC.
Consulting Engineers
ARLINGTON HEIGHTS, ILLINOIS
(708) 398-1441

BORING STARTED	May 13, 1991		
BORING COMPLETED	May 13, 1991		
RIG	CME 55	FOREMAN	TOB
DRAWN	JD	APPROVED	DOB
JOB #	91261	SHEET	1 of 1

LOG OF BORING NO. B-2

CLIENT	ARCHITECT-ENGINEER
Clean Harbors of Chicago	
LOCATION	**PROJECT DESCRIPTION**
Chicago, Illinois	Proposed development

DEPTH BELOW GROUND SURFACE	SAMPLE NO.	TYPE SAMPLE	SAMPLE DISTANCE	SAMPLE RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³
					GROUND SURFACE ELEVATION	
	1				Misc. cinder, silt, clay, sand and organics-brown and gray-dense (fill) chemical odor	
	2	SS				
		SS				
10.0		SS				
15		SS			Sandy clay-trace gravel-brown-dense (CL) Chemical odor	
20.0	6	SS			Silty clay-trace sand and gravel-gray-tough to very tough (CL)	
25.0	7	SS				
					End of Boring	



WATER LEVEL OBSERVATIONS	
W.L.	-15.0' wd
W.L.	obstruction at -6.0'

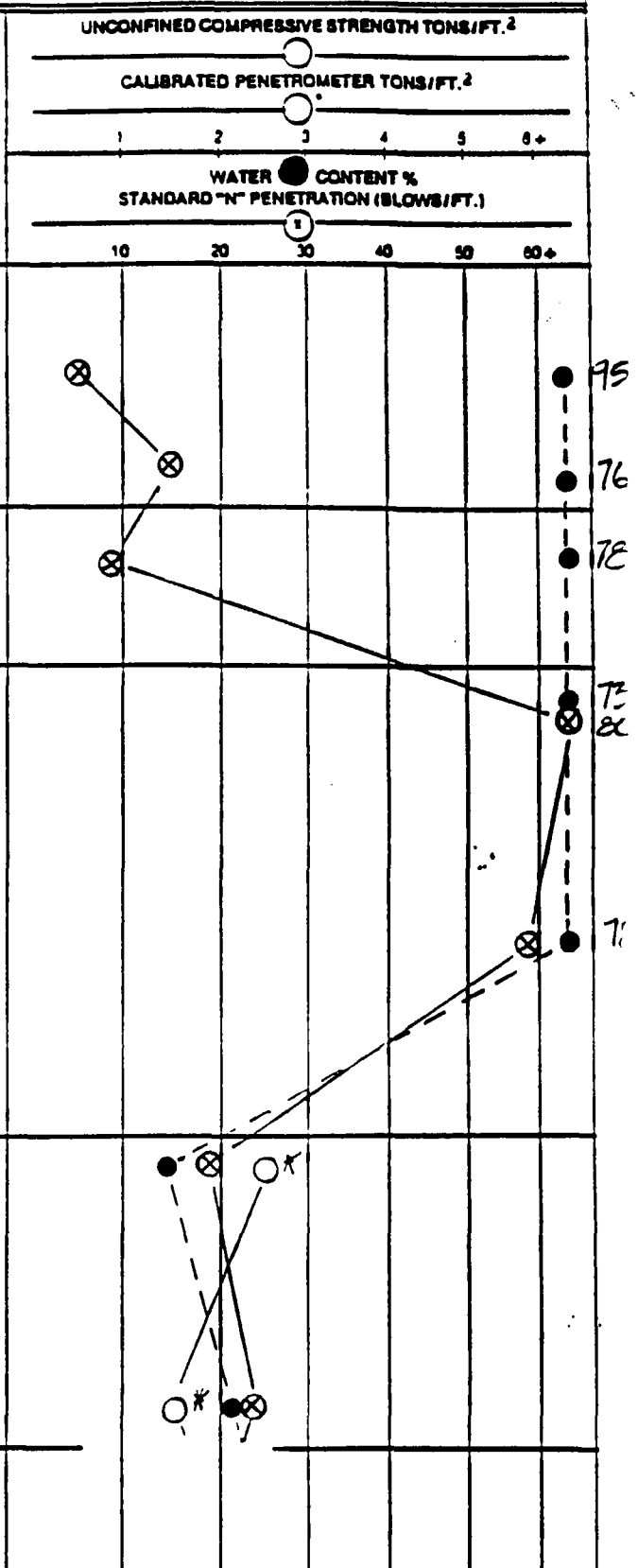
O'BRIEN & ASSOCIATES, INC.
Consulting Engineers
ARLINGTON HEIGHTS, ILLINOIS
(708) 398-1441

BORING STARTED	May 14, 1991		
BORING COMPLETED	May 14, 1991		
RIG	CME 55	FOREMAN	TOB
DRAWN	JD	APPROVED	DOB
JOB #	91261	SHEET	1 of 1

LOG OF BORING NO. B-3

CLIENT	ARCHITECT-ENGINEER
Clean Harbors of Chicago	
LOCATION	**PROJECT DESCRIPTION**
Chicago, Illinois	Proposed development

DEPTH BELOW GROUND SURFACE	SAMPLE NO.	TYPE SAMPLE	SAMPLE DISTANCE	SAMPLE RECOVERY	DESCRIPTION OF MATERIAL / GROUND SURFACE ELEVATION	UNIT DRY WT. LBS./FT.³
	1	ss			Misc. cinder, silt, clay and organics-brown and gray-loose (Fill)	
5.0	2	ss				
	3	ss			Misc. cinder, sand, silt, clay and organics-brown and gray-loose (Fill)	
10.0	4	ss			Misc. cinder, sand, silt, clay, gravel and organics-brown-dense (Fill) Chemical Odor	
15.0	5	ss				
20.0	6	ss			Silty clay-trace sand and gravel-gray-tough to very tough (CL)	
25.0	7	ss				



Continued...

WATER LEVEL OBSERVATIONS	
W.L.	~5.0' wd
W.L.	~32.0' bcr
	~10.0' acr

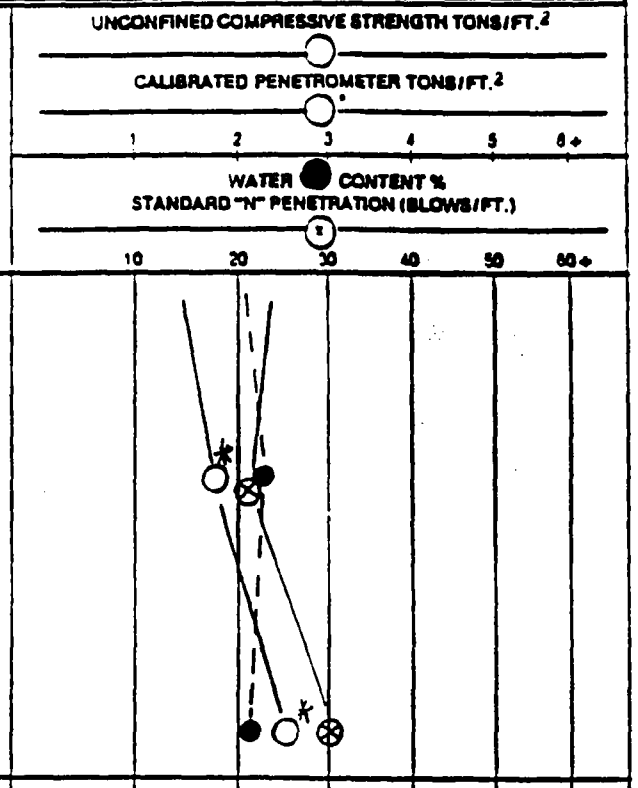
O'BRIEN & ASSOCIATES, INC.
Consulting Engineers
ARLINGTON HEIGHTS, ILLINOIS
(708) 398-1441

BORING STARTED	May 14, 1991		
BORING COMPLETED	May 14, 1991		
RIG	CME 55	FOREMAN	TOB
DRAWN	JD	APPROVED	DOB
JOB #	91261	SHEET	1 OF 2

LOG OF BORING NO. [illegible]

CLIENT	ARCHITECT-ENGINEER
Clean Harbors of Chicago	
LOCATION	**PROJECT DESCRIPTION**
Chicago, Illinois	Proposed development

DEPTH BELOW GROUND SURFACE	SAMPLE NO.	TYPE SAMPLE	SAMPLE DISTANCE	SAMPLE RECOVERY	DESCRIPTION OF MATERIAL / GROUND SURFACE ELEVATION	UNIT DRY WT. LBS./FT.³
30.0	8	ss			Silty clay-trace sand and gravel-gray-tough to very tough (CL)	
35.0	9	ss				
					End of Boring	



WATER LEVEL OBSERVATIONS	
W.L.	-5.0' wd
W.L.	-32.0' bcr
	-10.0' acr

O'BRIEN & ASSOCIATES, INC.
Consulting Engineers
ARLINGTON HEIGHTS, ILLINOIS
(708) 398-1441

BORING STARTED	May 14, 1991		
BORING COMPLETED	May 14, 1991		
RIG	CME 55	FOREMAN	TOB
DRAWN	JD	APPROVED	DOB
JOB #	91261	SHEET	2 OF 2

LOG OF BORING NO. B-4

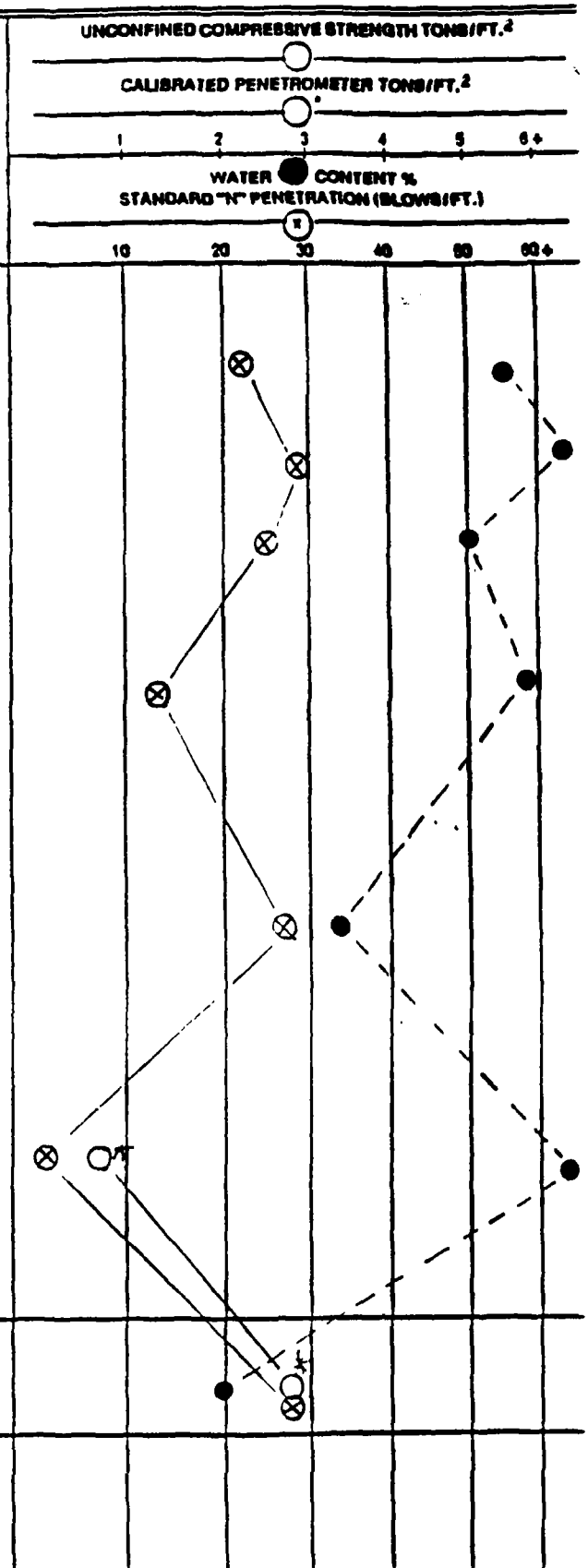
CLIENT
Clean Harbors of Chicago

ARCHITECT-ENGINEER

LOCATION
Chicago, Illinois

PROJECT DESCRIPTION
Proposed development

DEPTH BELOW GROUND SURFACE	SAMPLE NO.	TYPE SAMPLE	SAMPLE DISTANCE	SAMPLE RECOVERY	DESCRIPTION OF MATERIAL / GROUND SURFACE ELEVATION	UNIT DRY WT. LBS./FT.³
	1	ss			Misc. cinder, silt, clay, sand and organics-dark gray and dark brown-loose to medium dense (Fill) Chemical odor	
5.0	2	ss				
	3	ss				
10.0	4	ss				
15.0	5	ss				
20.0	6	ss				
25.0	7	ss			Silty clay-trace sand and gravel-gray-very tough (CL)	
					End of Boring	



WATER LEVEL OBSERVATIONS	
W.L.	-20.0' wd
W.L.	-20.0' bcr
	-18.0' acr

O'BRIEN & ASSOCIATES, INC.
Consulting Engineers
ARLINGTON HEIGHTS, ILLINOIS
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BORING STARTED	May 13 , 1991		
BORING COMPLETED	May 13 , 1991		
RIG	CME 55	FOREMAN	TOB
DRAWN	JD	APPROVED	DOB